SONY®

SERVICE MANUAL

Series

CVC-2100A

SONY CORPORATION
7−35, KITASHINAGAWA−6
SHINAGAWA-KU
TOKYO, JAPAN

® Registered Trademark Sony Corporation
© 1968

PRINTED IN JAPAN

TABLE OF CONTENTS

Section	Title	Page
1.	GENERAL DESCRIPTION	
1-1.	Introduction	1-1
1-2.	Specifications	1-1
1-3.	Operation (with SONY Videocorders)	1-1
1-4.	CCTV operation	1-2
1-5.	Connections	1-2
1-6.	Viewfinder CVF-4	1-2
2.	CIRCUIT DESCRIPTION	
2-1.	General Information	2-1
2-2.	The Vidicon	2-1
2-3.	Video Circuits	2-2
2-4.	VHF Modulator	2-3
2-5.	Horizontal Deflection Circuits	2-3
2-6.	Vertical Deflection Circuits	2-4
2-7.	Blanking Circuits	2-4
2-8.	Sync Circuits	2-4
2-9.	Power Supply	2-4
2-10.	Viewfinder Connections (CVF-4)	2-5
3.	MAINTENANCE	
3-1.	Precautions	3-1
3-2.	Disassembly	3-1
3-3.	Vidicon Replacement	3-1
3-4.	Vidicon Adjustments	3-2
3-5.	Optical Focus	3-2
3-6.	Video Adjustments	3-3
3-7.	Deflection Adjustments	3-5
3-8.	Power Board Adjustment	3-6
4.	TROUBLESHOOTING NOTES	
4-1.	Test Jig	4-1
4-2.	Direct Monitor Connections	4-1
4-3.	Video Checks	4-1
4-4.	Viewfinder Connector	4-4
5.	PRINTED CIRCUIT BOARDS	
5-1.	V(Video)Circuit Board, Conductor side	5-1
	V(Video) Circuit Board, Component side	5-2
5-2.	D(Deflection) Circuit Board, Conductor side	5-3
	D(Deflection) Circuit Board, Component side	5-4
5-3.	P(Power)Circuit Board, Conductor side	5-5
	P(Power) Circuit Board, Component side	5-6
6.	SCHEMATIC DIAGRAMS	
6-1.	Transistor Voltage Chart	6-1
6-2.	Waveforms	6-2
6-3.	Schematic Diagram	6-3
7.	EXPLODED DIAGRAMS	
7-1.	Outside Trim	7-1
7-2.	Inside Trim	7-2
7-3.	Vidicon Mount	7-3
8.	PARTS LIST	
8-1.	Mechanical Parts	8-1
8-2.	Electrical Parts	8-1

SECTION 1
GENERAL DESCRIPTION

1-1. INTRODUCTION

The Model CVC-2100A is a high-performance low-cost TV Camera designed for CCTV applications and as the live-action pickup for SONY Videocorders.

Automatic sensitivity control and ultra-stable circuitry simplifies operation to simply aiming and focusing. The CVC-2100A adapts itself automatically to suit a wide range of lighting conditions.

A 3-position selector switch on the rear panel sets up the camera for either Videocorder or CCTV applications. In the VTR position of the selector, video is fed to a 6-pin connector that mates with the camera/videocorder cable. In this mode of operation, the camera receives 2:1 interlace sync from the SONY Videocorder. In the VIDEO position of the selector, video is brought out to a standard UHF connector, and the vertical deflection oscillator is synchronized by the power-line frequency (random-interlace operation). In the RF position of the selector, a VHF TV channel (2, 3 or 4) is modulated with the camera's video and the r-f output appears at the UHF connector. Line-lock sync with random interlace is also applied in the RF position of the selector.

The CVC-2100A is made to accept a 4-inch Viewfinder, Model CVF-4, that fastens to the top surface of the camera. The viewfinder gives the flexibility and convenience of studio cameras by allowing the operator to monitor all camera adjustments locally.

The power switch has three positions: OFF - STANDBY - ON. In the STANDBY position, all circuits are powered, but light is excluded from the vidicon by a mechanical shutter. This protects the vidicon from accidental image burn. In the ON position, the shutter is lifted and the camera is fully operational.

The operating temperature range is 20° F to 125°F and the tolerable line-voltage variation is ±10% of rated value. Within these limits horizontal frequency changes less than 1% and all other characteristics remain unchanged.

1-2. SPECIFICATIONS

Camera Tube:	- High-sensitivity vidicon (M3016/7262A)
Semiconductors:	- 30 transistors plus 20 diodes
Scanning System:	
(VTR output)	- Hor. and Vert. external synchronizing system
(Video & RF output)	- Vert. line lock synchronizing system Hor. Random Interlace
Standard Lens:	- F1.8, 25mm "C" mount
Horizontal Resolution:	
(VTR & Video output)	- Greater than 450 lines (camera alone)
(RF output)	- 300 lines
Horizontal Frequency:	- 15.75 KHz
Vertical Frequency:	- 60 Hz
Signal-to-Noise ratio:	- Greater than 40 dB
Video Output:	- 1.4V (peak-to-peak) sync. negative, into 75 ohms
Automatic Sensitivity Control Range:	- 300 lux to 50,000 lux (with F1.8 lens)
Power Requirements:	- AC 117V 60 Hz
Power Consumption:	- 12 watts
Dimensions:	- 107 mm (W) × 143 mm (H) × 265 mm(D) (4-1/4″(W) × 5-5/8″(H) × 10-7/16″(D))
Weight:	- 3.3kg (7 lbs. 5 oz.)

1-3. OPERATION (with SONY Videocorders)

Step 1. Connect the camera cable (supplied) to the receptacle marked VTR OUT at the rear of the camera.

Step 2. Connect the other end of this cable to the receptacle marked CAMERA on the rear jack-plate of the Videocorder (SONY CV-2000 Series).

Step 3. Connect the power cord (supplied) to the power receptacle at the rear of the camera. Plug this cord into a 117-volt AC outlet or one of the AC receptacles at the rear of the Videocorder.

Step 4. Set the power switch to STANDBY, the selector switch to VTR, and remove the lens cap.

Step 5. Set up the Videocorder for Camera-Record operation; see the Videocorder's operation manual. Put the Videocorder in the record (E to E) mode by pressing the red RECORD button.

Step 6. Set the camera's power switch to ON. The picture should appear on the screen of the Videocorder's monitor. Focus the camera optically by turning the focus ring (calibrated in feet). Set for best focus. Open the lens iris fully (F 1.8). Use this lens stop for most indoor operations. When operating in brightly lighted or outdoor areas, stop the lens down as required to produce a picture with good contrast. Note: if the lens is stopped down too far (not enough light input) contrast decreases and the tendency towards image retention and smear of moving objects increases. Conversely, frequent operation with too great a lens opening, as evidenced by a very "contrasty" picture, may reduce the useful life of the vidicon.

Step 7. Electrical focus has been set at the factory. However, if focus is unsatisfactory, adjust the FOCUS control at the rear panel with a small screwdriver. Set for best focus. The picture rotates about its center as focus is turned; best focus should coincide with an upright picture.

Step 8. To adjust beam current, turn the BEAM control on the rear panel with a small screwdriver. Turn this control fully clockwise, then turn counterclockwise slowly until the picture shows good contrast with no loss of detail in the highlights. An incorrect beam setting results in a washed-out picture (loss of detail in bright areas), negative picture, flicker in the highlights, double images or images that are too large or too small.

1-4. CCTV OPERATION

A. VIDEO OUTPUT

Step 1. Connect the monitor(s) to the camera using RG-59U cable or equivalent and a male UHF connector (PL-259) at the UHF connector on the rear panel of the camera. Make sure that the equipment fed by the camera terminates the feed cable in 75 ohms.

Step 2. Set the selector switch to VIDEO. Follow Steps 3, 4, 6, 7 and 8 in the previous section.

B. R-F OUTPUT

This mode of operation permits conventional TV sets to be used as monitors.

Step 1. Connect the r-f output cable to the UHF connector on the rear of the camera using a RG-59U cable or equivalent, equipped with a male UHF connector (PL-259).

Step 2. The other end of the cable should be equipped with a BALUN (72 ohm – 300 ohm transformer) to permit connection to the 300–ohm antenna terminals on the TV set.

Step 3. Set the selector switch on the camera to the RF position.

Step 4. Set the channel selector on the TV set to an inactive channel between 2, 3 or 4.

Step 5. Follow Steps 3 and 4 in Section 1-3 to power the camera. Turn the power switch to ON.

Step 6. Using a small screwdriver, turn the RF control in the rear panel of the camera until the picture appears on the screen of the monitor. Adjust for best resolution without overshoot. Note, if a blank, noise-free raster is obtained, check the lens cap, power switch and lens opening to make sure that the video portion of the camera is fully operational.

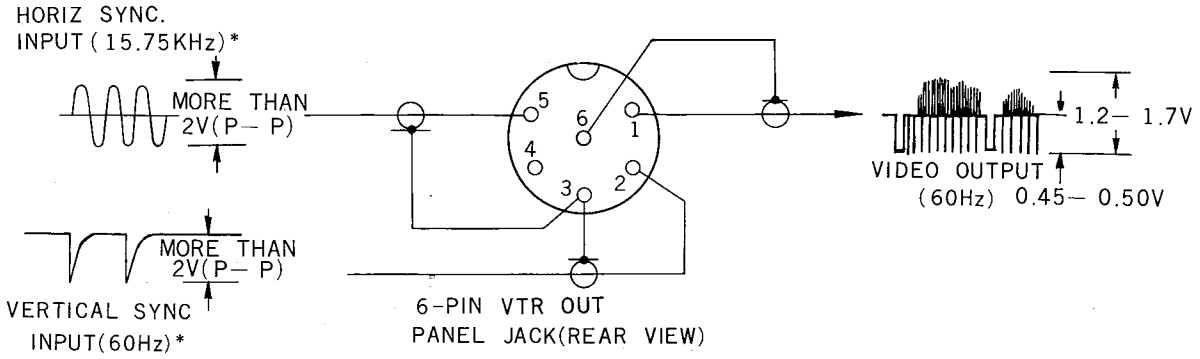
1-5. CONNECTIONS

Figure 1-1 shows sync input and video output signals at the 6-pin VTR connector when the camera is used in the VTR mode. (Sync signals appear only when the motor in the VTR is running).

1-6. VIEWFINDER CVF-4

To connect the Viewfinder, first remove the rectangular plastic cap that covers the viewfinder connector on the top surface of the camera. Place the Viewfinder atop the camera so that the two studs at the rear of the camera enter the large holes in the mounting slots on the bottom of the Viewfinder. Slide the Viewfinder towards the rear of the camera so that the studs engage the slots. Position the male connector on the bottom of the Viewfinder over the receptacle on the top of the camera and push down gently until the connector is seated. Push the mounting screw down and tighten using a coin or screwdriver.

Note. All electrical connections between the Viewfinder and the camera are completed at the mating connectors. The raster on the Viewfinder will appear immediately when the camera is turned on. The picture appears a few seconds later when the vidicon warms up. Contrast and brightness controls atop the CVF-4 affect the Viewfinder picture only, and do not affect the video output of the camera.



*SYNC SIGNALS FROM THE VTR(MOTOR RUNNING)

FIG. 1-1. INPUT AND OUTPUT SIGNALS AT THE 6-PIN VTR CONNECTOR.

SECTION 2
CIRCUIT DESCRIPTION

2-1. GENERAL INFORMATION

The CVC-2100A uses three Printed Circuit Boards and one RF Block. If you hold the camera with the lens facing you, the Video Board (V) is at the right side front, the Deflection Board (D) is at the left side, the Power Board (P) is at the right side rear, and the shielded Modulator (RF) Block is at the left rear.

The vidicon is mounted inside a coil assembly directly behind the lens mount. This coil assembly contains the focus coil (outer) and the deflection coils (inner) sharing a common axis.

Video output from the vidicon is obtained from a spring connector that contacts the target ring at the lens end of the vidicon. This signal is routed directly to the Video Board where all of the video amplification takes place. Automatic sensitivity control circuits are also found on the V board.

The Power Supply Board (P) contains the 14-volt regulated supply, the focus-current supply and the high-voltage and bias supplies for the vidicon.

Beam intensity is controlled by the rear-panel BEAM control (vidicon bias). Spot focus is controlled by the rear-panel FOCUS control which sets the current in the focus coil.

The Deflection Board (D) contains the deflection oscillators and power stages that supply deflection currents to the windings on the deflection yoke. In addition, blanking and sync signals are developed in the D board.

The deflection oscillators are normally free-running. However, they are locked up on the precise sync signals provided by the Videocorder (VTR motor running) to provide a 2:1 interlaced signal in the VTR mode of operation. In the VIDEO and RF modes of operation the vertical oscillator is synchronized by the power-line frequency and the horizontal oscillator runs free. This provides a stable, random-interlace picture.

The Modulator (RF) Block contains a VHF oscillator that can be tuned to the picture-carrier frequencies of channels 2, 3 or 4. A diode AM modulator modulates the VHF carrier with the camera's video to provide in excess of 5 millivolts r-f output on the selected channel.

2-2. THE VIDICON

Vidicons are used in most closed-circuit TV cameras. Their small size, simplicity and ruggedness make them ideal for closed-circuit use. All vidicons make use of the same principles of operation. They differ primarily in size, sensitivity, resolution, and spectral response.

The light-sensitive element of the vidicon is the target. See Fig. 2-2. It consists of a transparent conductive film on the inner surface of the glass faceplate, and a photoconducting layer immediately behind it (electron-gun side). The photoconductive layer changes resistance in inverse proportion to the light falling on it. That is, an increase in light causes resistance to decrease.

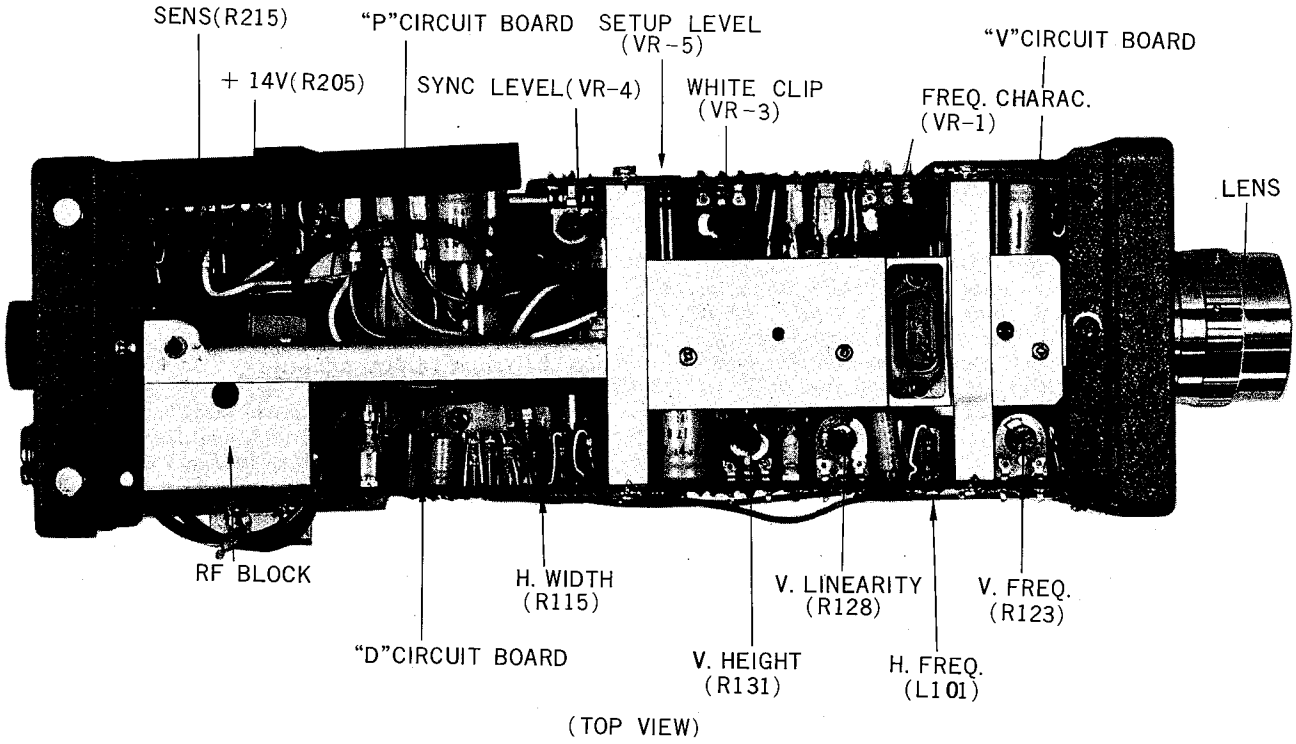


FIG. 2-1. LOCATION OF MAJOR SECTIONS

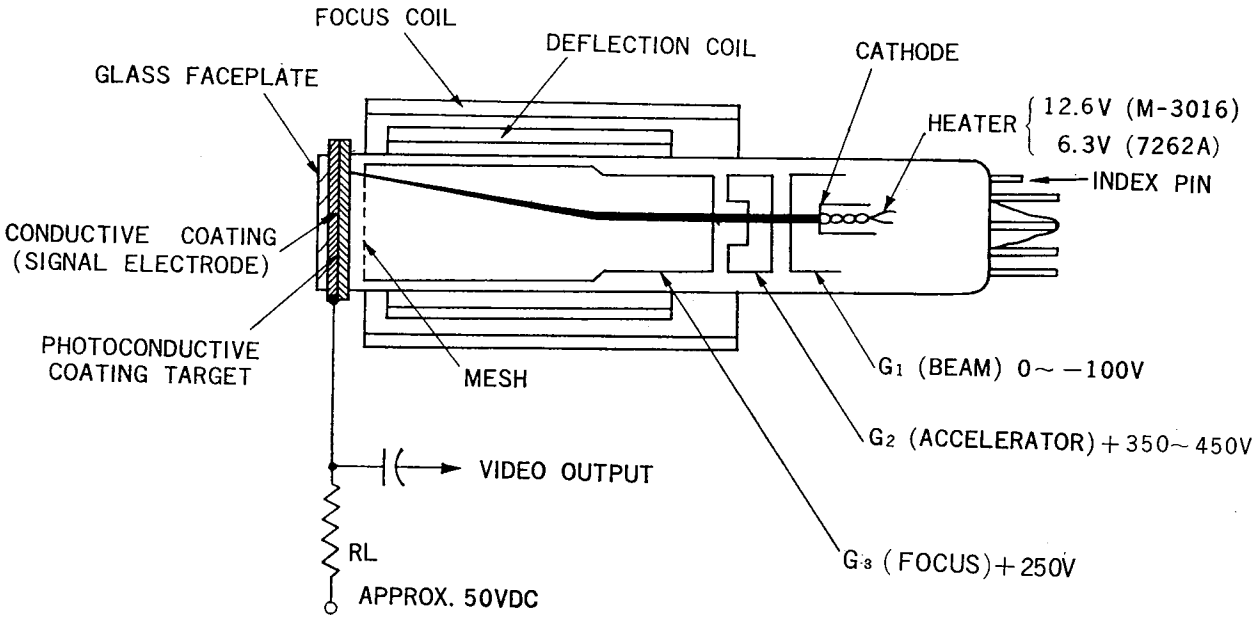


FIG. 2-2. VIDICON

Light reflected from the scene to be televised is focused optically on the target area by the lens system. As the moving election beam strikes a point of light on the target area, a larger current can flow through the cathode-target circuit. In this way, varying light values cause varying currents to flow in the target circuit. The cathode, electron beam, target and load resistor constitute a series circuit in which the light-controlled signal current flows. The voltage developed across the load resistor is amplified and combined with blanking and synchronizing signals to form the composite video output signal of the camera.

2-3. VIDEO CIRCUITS

Refer to the Block Diagram, Fig. 2-3, and the fold-out schematic diagram. Output from the vidicon is developed across the load resistor R3 and coupled through C1 and L1 to the first video amplifier. The L1/R4 circuit combines the total output capacitance of the vidicon and the input capacitance of X1 to form a frequency compensation circuit that partially compensates for the loss of high video frequencies that is inherent in coupling the high impedance vidicon to the low input impedance of the transistor amplifier. Transistors X1 and X2 form a feedback pair with dc feedback to ensure circuit stability and wide frequency response. Partial emitter peaking (C7) is used in the emitter circuit of X2. The output of X2 feeds through C8 to the base of X3. This transistor employs shunt peaking (L2) in its collector circuit to provide high frequency boost and emitter peaking (C10/VR1) to boost low-to-mid video frequencies.

Transistors X4, X5, and X6 form a direct-coupled group in a NPN/PNP/NPN configuration. Transistor X10, in the base circuit of X6 performs the "cleaner" operation. It is driven into saturation by blanking pulses to eliminate noise in the set-up level that may be generated in the early video stages.

The coupling circuit between X6 and X7 contains the keyed clamp X12. This clamp is keyed into conduction by sync pulses and clamps the tips of blanking pulses to the voltage picked off at the junction of R30, R29 and VR-5. The latter is adjustable to control the set-up level of the composite video output signal.

Transistor X7 is direct-coupled to X8, the emitter follower that drives the video output stages. The output circuit for X8 contains a diode clipper circuit that conducts and clips off positive signal excursions that exceed the voltage picked off at the arm of VR-3. This is the white-clip adjustment. It is set to limit white peaks so that the r-f modulator will not be overdriven during r-f operation.

The output of X8 drives the bases of X9 and X11 in parallel. Transistor X9 is the video output stage for the camera; X11 is the video output stage that supplies signal to the CVF-4 Viewfinder.

Sync is added to the video output at the emitter of X9 through the SYNC-LEVEL control VR-4. The composite video is then routed to the VTR connector, the UHF connector or the RF Modulator through the selector switch S2. The output of X11 is routed directly to pin 5 of the Viewfinder connector. Note that sync is not added (not needed) to this feed.

Automatic sensitivity control is achieved by making the d-c target voltage a function of the average-white video signal. A sample of the video signal at the emitter of X6 is fed to X13 and thence to a voltage doubler consisting of C35, D3 and D4. Transistor X13 prevents the rectifier from loading the video circuits. The output of the rectifier is a positive dc voltage that is proportional to the average white component of the video signal. This dc voltage controls the conduction of X14. The collector voltage for X14 is also the target voltage for the vidicon, since there is little dc voltage drop across resistors R2 and R3. These resistors, in conjunction with C39 and C2 decouple the target voltage supply and prolong the time constant of the feedback system to prevent oscillation.

An increase in light input results in greater output from the D3/D4 rectifier, increased conduction of X14

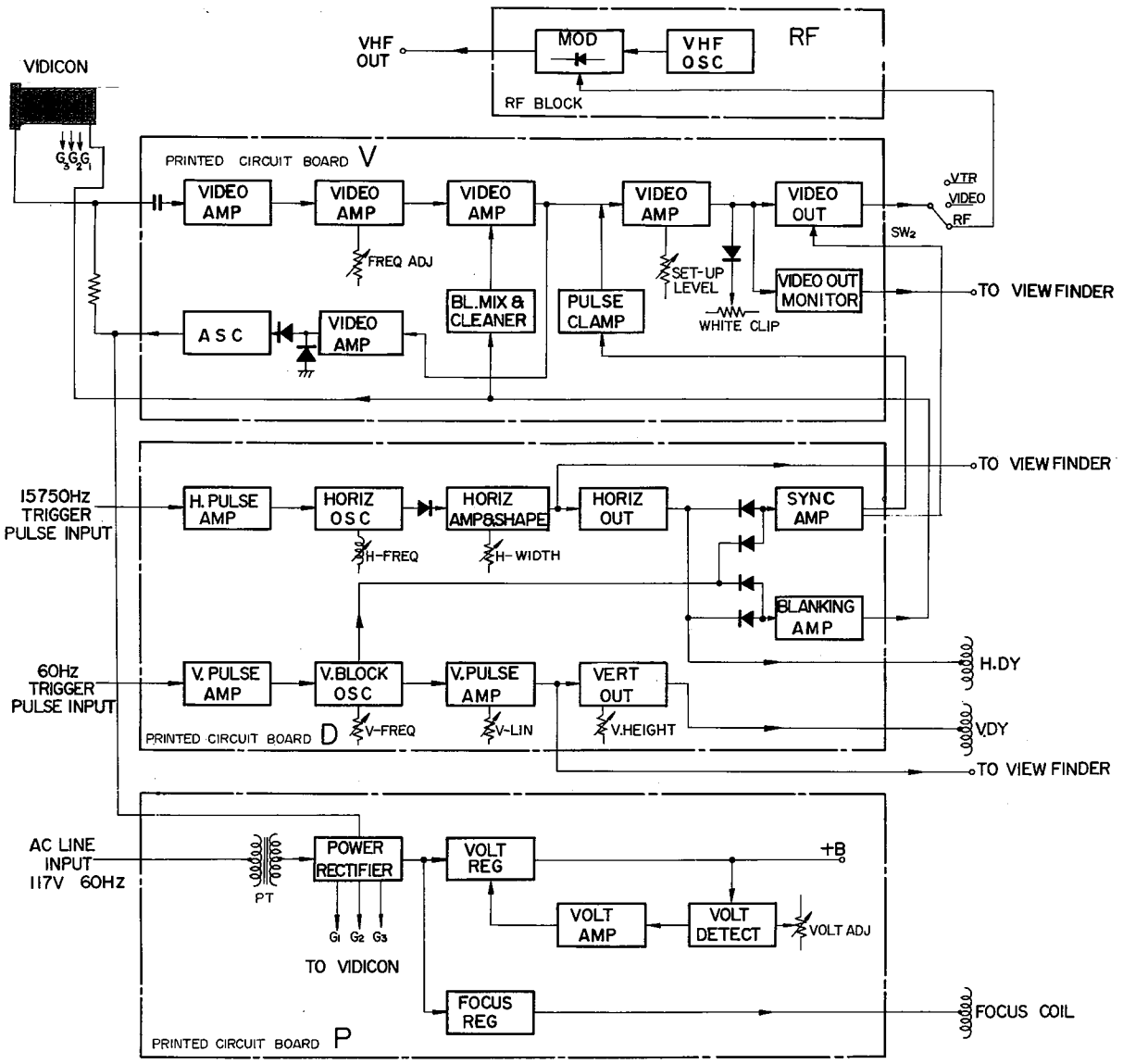


FIG. 2-3. SYSTEM BLOCK DIAGRAM

and a lowering of target voltage. A drop in light input has the opposite effect. In this way vidicon sensitivity is varied to maintain a nearly constant video output despite wide variations in light input.

2-4. VHF MODULATOR

In the RF position of the selector switch, composite video from the emitter of X9 is coupled through S2 and R306 to the diode modulator. Here video and r-f from the secondary of L303 are added across the diode D301. This diode forms a simple amplitude modulator. Its dc operating point is adjusted by R305 to provide linear modulation. Coil L301 keeps r-f signal out of the video circuits and the coupling capacitor C307 couples only the r-f component to the output connector.

The oscillator is a common-base circuit which requires no phase inversion in the feedback circuit. Oscillator feedback is from collector to emitter via C303. The tank circuit is tuned by C302. This capacitor is a rear-panel control which can be set to tune the oscillator through channels 2 to 4.

2-5. HORIZONTAL DEFLECTION CIRCUITS

Horizontal sweep signals originate in a triggered sine-wave type oscillator X103. This stage is synchronized by 15.75 KHz signals from the Videocorder when the selector on the camera is set to VTR. In the VIDEO and RF positions of the selector, sync input is grounded and the horizontal oscillator runs free.

Horizontal sync signals (sine waves) come into the camera at pin 5 of the 6-pin VTR connector. Negative peaks are clamped by C102 and D101. The clamped signals are clipped and amplified by X102 and applied to the base of the oscillator X103.

X103 and its associated components form a sine-wave oscillator that runs normally at a frequency slightly below 15.75 KHz. The components of the tank circuit have opposite temperature coefficients to offset the effect of temperature changes. L101 is adjustable to set oscillator frequency. C105 provides feedback to sustain oscillations even in the absence of sync pulses. D102, in the output circuit of X103 clips the negative swing of the signal and applies positive pulses to the driver stage X104.

X104 acts as a nonlinear amplifier to shape the drive signal into a rectangular pulse having a pulse duration of 12 to 14 microseconds.

The drive signal is inverted by T102 and acts to cut off the horizontal output transistor X105 during the retrace interval. The output circuit is conventional and uses D103 as the damper. To prevent sweep distortion at the point where damper conduction stops and X105 conduction begins, the damper diode is provided with a small forward bias developed across C110. The action of this forward bias circuit is illustrated in Fig. 2-4.

FIG. 2-4. FORWARD BIAS ON THE DAMPER PERMITS A SMOOTH CROSSOVER POINT BETWEEN THE DAMPER AND THE HORIZONTAL OUTPUT STAGE.

Deflection currents feed through C111 to the horizontal deflection winding in the deflection yoke. R115 determines the amplitude of this current and therefore controls the width of the vidicon's raster.

2-6. VERTICAL DEFLECTION CIRCUITS

Vertical deflection signals originate in the blocking oscillator X107. This oscillator free runs at about 56 Hz and locks up on either the 60-Hz pulses supplied by the Videocorder (VTR mode) or the 60-Hz power-frequency (VIDEO or RF modes).

Vertical sync signals from the VTR enter the camera at pin 2 of the VTR connector. These feed through S3 (in the VTR position) to the sync amplifier X106. In the VIDEO or RF positions of S3, a sample of the power-frequency signal developed across R220 is supplied to the sync amplifier X106.

X106 inverts the sync signals and applies them to the blocking oscillator X107. This is a conventional blocking oscillator in which the duration of the off period is determined by the discharge of C115 into resistors R124, R123, and R112. R124 controls bias to determine the point at which X107 comes into conduction, and so controls oscillator frequency. The output sawtooth is developed by the components C116, R127, R128 and C117. R128 is adjustable to permit variation of waveshape and so acts as the vertical linearity control. Transistors X108 and X109 form the driver and vertical output stage respectively. Feedback is achieved by returning the cold side of the vertical deflection winding to a variable control R131 in the emitter circuit of X108. Since R131 controls the amount of negative feedback, it serves as the vertical size or height control.

2-7. BLANKING CIRCUITS

Vertical and horizontal deflection signals are combined in the blanking circuits to form pulses that blank the vidicon during vertical and horizontal retrace, and to "clean" the video signal's set up level during these retrace periods.

Horizontal pulses from two sources, the collector of X104 and the secondary of T102, are combined at the base of X110, the blanking amplifier. By combining these pulses, a blanking pulse of correct duration is obtained. Vertical pulses developed across R125 are fed to X110 through two paths, one consists of C122, R145 and D107, the other is R143, C123, R144 and D108. The latter circuit integrates the waveform. By combining the signals from both paths, a pulse of longer overall duration is obtained. The diodes D107, D108, and D109 permit pulse mixing at the base of X110 and isolate the pulse sources from one another. X110 inverts and squares-off the blanking pulses.

The full output of X110 is applied to the cathode of the vidicon to cut off the vidicon during the blanking periods. A tapped-down output, developed across R148 is applied to the "cleaner" switch X10.

2-8. SYNC CIRCUITS

Deflection signals are shaped and combined in the sync circuits to form the sync pulses that are added to the video and blanking signals to form the composite video output. A horizontal flyback pulse, developed across the secondary of T102, and a vertical pulse developed across R125 are mixed by D105 and D106 to form a combined sync signal across R138. The diodes isolate the pulse sources from one another. The combined sync signal is then fed to X111 which inverts the pulses to produce positive-going pulses. The full output of X111 is fed to the keyed clamp X12 to clamp blanking pulses to the set-up level. Part of the output of X111 is fed to X12. Here the pulses are inverted once more to form the negative sync pulses that are added to the video output of X9 through C29 and VR-4. The latter controls the amplitude of the sync component in the composite video output.

2-9. POWER SUPPLY

The bridge rectifier D207 – D210 supplies dc power for the camera circuits through the series regulator X201. The conduction of X201 is controlled by the pre-regulator X202 and the error detector X203. The latter compares a sample of the dc output voltage with the reference voltage developed by the Zener diode D201. R205 is adjusted to provide an output voltage from the regulator of +14 volts.

Transistor X204 acts as a constant-current supply for the focus coil. This system ensures unchanging focus despite the changes in focus coil resistance that accompanies warmup. Resistor R208 adjusts the bias on X204 to determine focus current.

High voltage for the vidicon electrodes is developed by D205. The G2 voltage (accelerating grid) is supplied from R211. A lower voltage, developed across the Zener diode D204 is applied through R212 to the G3/G4 connection for electrostatic focus. A variable dc voltage, picked off at the arm of R215 feeds the target voltage (ASC) system. R215 sets vidicon sensitivity and is adjusted to produce a specified "dark current" with the lens cap in place.

The lower tap on the high-voltage winding of the power transformer feeds a half wave rectifier that is poled to produce a negative output. The negative dc voltage is set by the BEAM control and applied to the control grid of the vidicon. A voltage divider R219 and R220 develops the 60 Hz sync signal used for line-lock operation in the Video/RF operating modes of the camera.

A tapped filament winding supplies 12 volts AC to the Viewfinder's power circuits via pins 9 and 6 of

the Viewfinder connector. The full 12 volts is applied to the vidicon when the M3016 vidicon is in use. The 6.3-volt tap is connected when the 7262A vidicon is in use.

2-10. VIEWFINDER CONNECTIONS (CVF-4)

The 9-pin connector atop the camera provides video and deflection drive signals for the Viewfinder. Video, without sync signals, is applied to pin 5 from the emitter of X11. Horizontal drive from the secondary of T101 is applied to pin 2. Vertical drive, developed across R136 in the emitter circuit of X109, is applied to pin 1. Note, since deflection drive signals are applied to the Viewfinder, the Viewfinder contains deflection output circuits and no deflection oscillators. Failure of a deflection oscillator in the camera will result in loss of deflection in the Viewfinder.

Twelve volts AC is applied to pins 9 and 6 of the Viewfinder to supply the Viewfinder's power circuits.

SECTION 3
MAINTENANCE

3-1. PRECAUTIONS

The following precautions should be observed to prevent damage to the vidicon.

1. Do not subject the vidicon to excessive jarring or mechanical shock. Avoid handling the vidicon with the faceplate pointed downward.

2. Before applying power to a defective camera of unknown condition, remove the socket from the vidicon and check deflection signals at the yoke (see Section 3-4). The vidicon may be damaged if power is applied in the absence of deflection signals.

3-2. DISASSEMBLY

Camera circuits are exposed for service by removing the top and side panels. If the Viewfinder is in place, remove it first. Remove the two Phillips-head screws that hold the top cover in place and lift off the top cover. Remove the two Phillips-head screws from each of the side panels and remove the side panels.

The power-supply board is protected by an insulating panel that is held in place by the board's mounting screws.

Note: one of the two screws that holds the power-supply board in place is a flat-head screw. Be sure to replace this screw in the mounting hole that is closer to the rear of the camera. The power-supply board has a lock washer soldered in place at this mounting position to insure proper grounding of the power-supply board.

3-3. VIDICON REPLACEMENT

To remove the vidicon, proceed as follows:

1. Remove the lens and the lens mount. The latter is secured by three Phillips-head screws.

2. Remove the top and side covers.

3. Remove the bottom cover; it is secured by five screws, one at the bottom and two on each side of the camera.

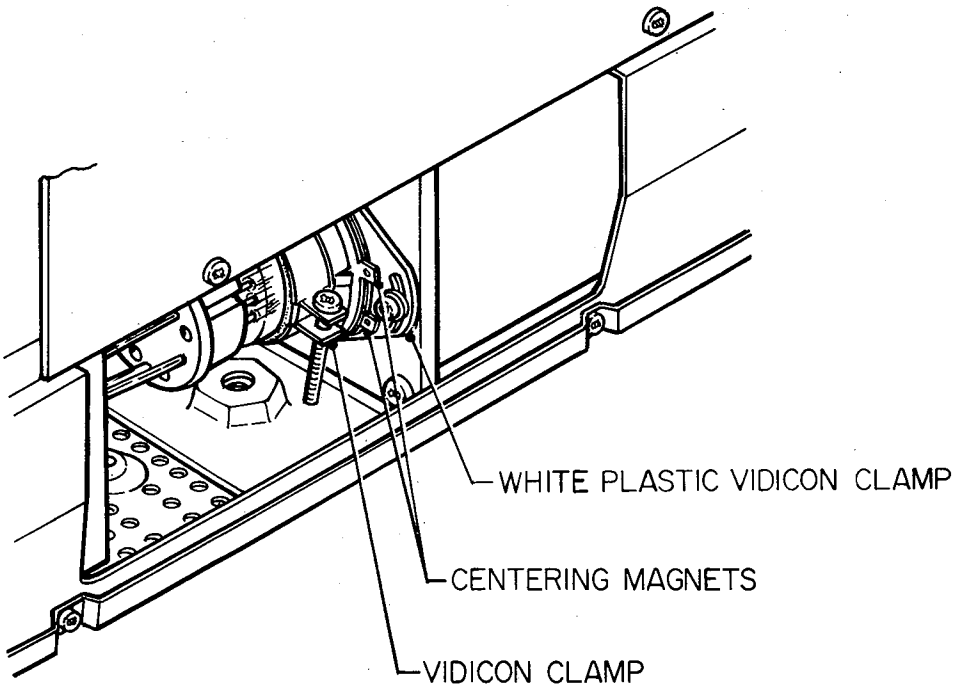


FIG. 3-1 VIDICON MOUNT

4. Loosen the clamp at the base of the vidicon. Pull the socket off the base of the vidicon.

5. Push the vidicon out through the front of the camera.

6. Inspect the replacement vidicon for scratches on the faceplate. Clean the faceplate carefully with lens tissue or a clean lint-free cloth.

7. Insert the replacement vidicon into the front of the camera. Slide it back as far as it will go.

8. Rotate the vidicon until the base index (the short pin between pins 1 and 8 is at the 3 o'clock position is viewed from the rear.

9. Tighten the clamp on the neck of the vidicon.

10. Replace the lens mounting ring and the lens.

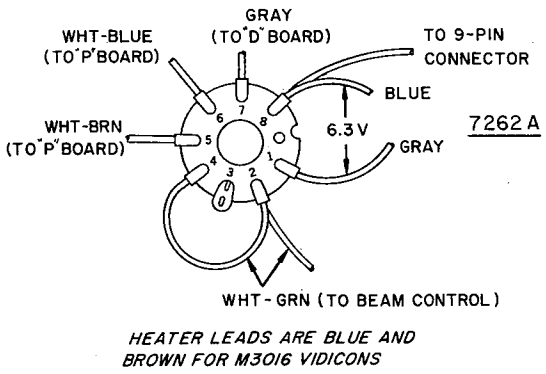
11. Proceed to 3-4. VIDICON ADJUSTMENTS.

3-4. VIDICON ADJUSTMENTS

Steps 1 and 4 should be checked whenever a new vidicon has been installed. In addition, the target-voltage adjustment should be performed when installing a new vidicon or whenever camera performance is tested. See Section 3-6. VIDEO ADJUSTMENTS.

1. Heater Voltage. Disregard this step if the replacement Vidicon is of the same type as the original. If the new vidicon has a different type number, a wiring change in the heater will be required. Two vidicon types may be used. The following table lists the vidicons and the heater requirements.

Type	Heater Voltage	Heater Leads
M3016	12.0 V	Blu - Brn
7262A	6.3 V	Gry - Blu



HEATER LEADS ARE BLUE AND BROWN FOR M3016 VIDICONS

Fig. 3-2. VIDICON SOCKET CONNECTIONS.

2. Socket Connections. Check the wiring at the vidicon socket. For 6.3 volts the wires at pins 1 and 8 should be gray and blue. For 12.0 volts, the leads at pins 1 and 8 should be blue and brown. These leads originate at the power transformer.

3. Deflection Checks. This step may be disregarded if the deflection circuits of the camera are known to be operating properly. If the condition of the deflection circuits is unknown, check the deflection waveforms, as shown in Fig. 3-3 before the vidicon socket is pushed onto the base of the vidicon. If normal waveforms are observed, turn off the camera and push the socket onto the base of the vidicon.

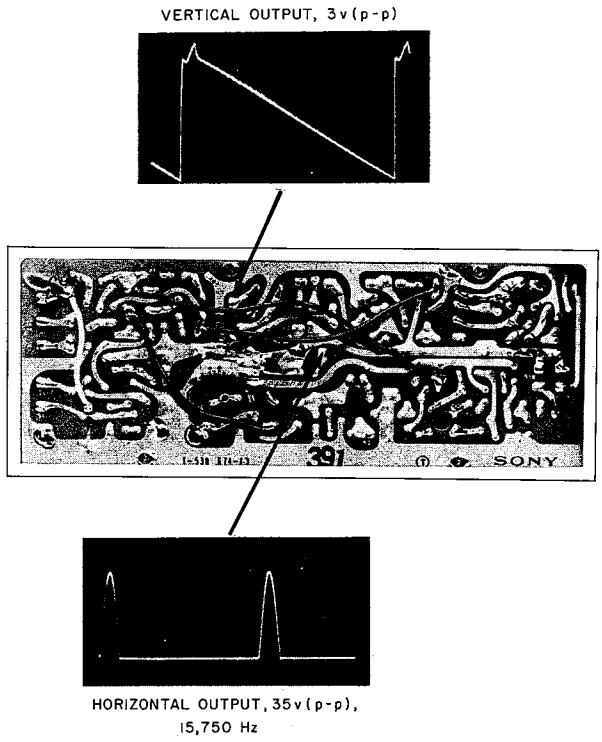


Fig. 3-3. DEFLECTION CHECKS.

4. Beam Centering. The vidicon employs a PM beam-centering magnet mounted forward of the vidicon clamp. This magnet functions in the same way as the PM centering devices used in most black-and-white TV receivers.

   To check beam centering, rotate electrical focus and watch the monitor. The picture should appear to rotate about the center of the screen. If the picture center shifts to the side or up or down, as focus is turned, the beam-centering magnets should be adjusted. Spread the tabs and rotate the entire assembly until the point around which it appears to rotate remains in center screen.

3-5. OPTICAL FOCUS

a. Turn on the camera and point it at a distant object (farther than 50 ft. away).

b. Set the lens to infinity and adjust electrical FOCUS, at the rear panel, for the sharpest possible focus. It is important to have electrical focus set correctly before the following adjustments are attempted.

c. Loosen the four Phillips-head screws at the bottom-front of the camera. Do not loosen these screws too much, just enough to allow the vidicon mount to move. Insert a thin screwdriver into the hole just below the lens mount and adjust the screw for best optical focus.

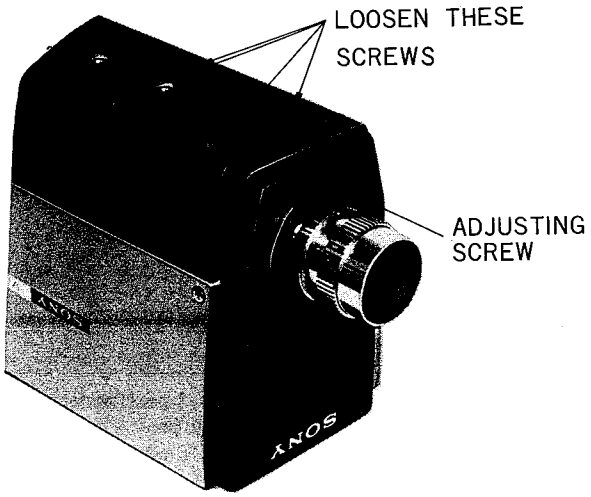


Fig. 3-4. OPTICAL FOCUS ADJUSTMENT.

d. Carefully tighten the four screws that lock the vidicon mount in place. Check optical focus after all screws have been tightened to make sure that focus has not changed. Repeat Steps c and d if necessary.

e. Point the camera at a test card 2-1/2 ft from the lens. Check to see that focus occurs at the 2. 5 ft mark on the focus ring. Reset the vidicon mount, if necessary.

Note: the following items should be checked whenever optical and electrical focus has been adjusted.

Tilted Picture. If the picture is tilted (not upright) the deflection yoke must be rotated about its axis. Loosen the two screws that secure the white plastic vidicon clamp to the rear of the yoke assembly. Rotate the yoke until the picture is upright, and tighten the two screws.

Flicker and Horizontal Bars. Occasionally, the bright parts of the picture may flicker or narrow horizontal bars may appear in the picture at or near the correct focus setting. These symptoms can usually be remedied by rotating the vidicon to a new position inside the yoke.

Loosen the vidicon clamp and turn the vidicon (do not apply torque to the socket) 90 or 180 degrees. Usually, best results are obtained when the index pin (short pin) is at the 3 o'clock position. Tighten the vidicon clamp at the best vidicon position.

3-6. VIDEO ADJUSTMENTS

Five adjustments determine the characteristics of the video output signal. These are:

Set-Up Level	(VR-5)
Target Voltage	(R 215)
Sync Level	(VR-4)
White Clip	(VR-3)
Aperture (Freq. Adj)	(VR-1)

Correct target voltage settings are important as they determine overall sensitivity, video-output level, and image persistance. It is recommended that video adjustments be made in the following sequence.

Preliminary Setup. Terminate the video output circuits of the camera in 75 ohms. This may be done by connecting the camera to the Videocorder in the usual way and placing the output selector in the VTR position. As an alternative, connect a 75-ohm terminator to the VIDEO and RF OUT jack on the rear of the camera. A 75-ohm resistor connected between the center pin and the body of a PL 259 connector will serve as the terminator. If the VTR is used as the terminator, connect the vertical input of the scope to the video output conductor on the V board. If a terminator is used, connect the scope across the 75-ohm resistor.

Set-up Level Adj.

a. Unsolder the target lead (yellow) where it connects to the extreme lower left of the video board.

b. Turn on the camera and set the power switch to STANDBY.

c. Adjust the scope controls to display two vertical sync signals. (Use LINE SYNC if the output selector is in the VIDEO position.)

d. Turn VR-5 (Set-up level) counterclockwise until the set-up level and the blanking level are the same, as shown in Fig. 3-5a. Then turn VR-5 clockwise until the set-up level is 0. 1 volts, as shown in Fig. 3-5b.

e. Turn off the camera and resolder the target lead to the video board.

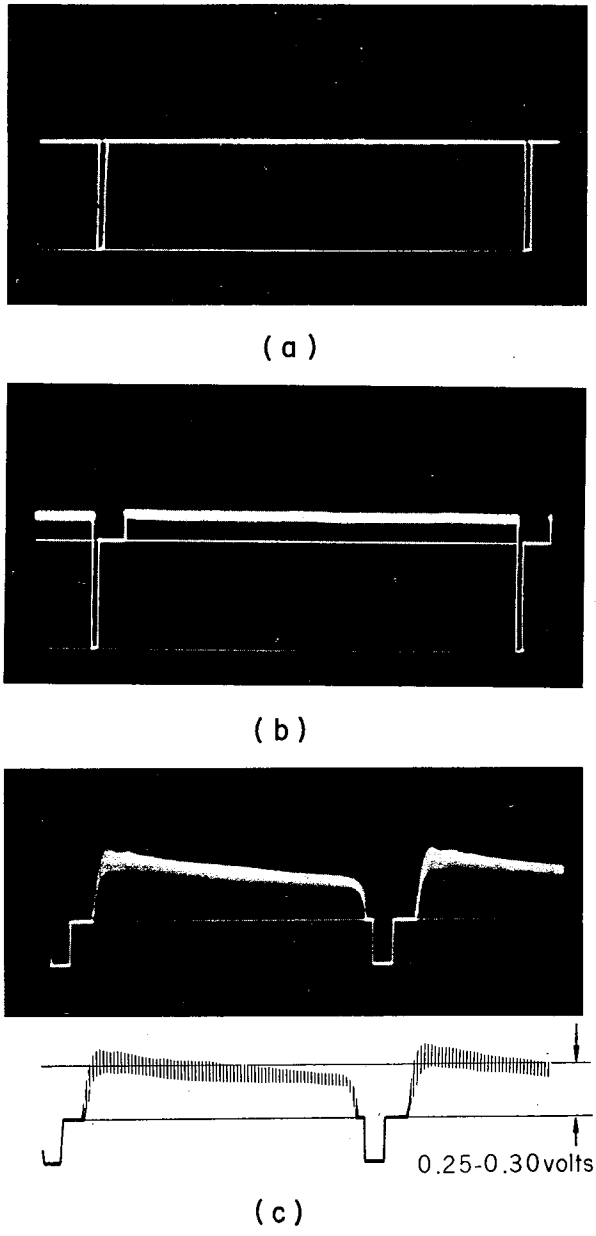


Fig. 3-5. SET-UP AND TARGET VOLTAGE SETTING WAVEFORMS.

Target Voltage Adj.

a. Preset Set-up level as described above.

b. Set the power switch to STANDBY and allow a few minutes for warmup.

c. Adjust the scope's controls to display two horizontal sync pulses.

d. Adjust R 215, Target Voltage, to produce a "white" signal of 0. 25 to 0. 3 v, as shown in Fig. 3-5c. The white or positive-going part of the signal represents the vidicon's dark current. The average dark current should produce about 0. 3 volts of positive-going signal.

Sync Level Adj.

a. Set the power switch to ON and point the camera at a test pattern 2. 5 ft from the lens.

b. Adjust Sync Level, VR-4, to produce a sync level of 0. 45 to 0. 50 volts, as shown in Fig. 3-6.

White Clip Adj.

a. Point the camera at ceiling-mounted fluorescent lamps (at least 8 feet away).

b. Adjust White Clip, VR-3, so that peak whites just show signs of clipping, and peak white is limited to 1.4 volts above the blanking level.

Freq Characteristic Adj.

a. Connect the camera to the Videocorder and set up the recorder in the camera E-to-E mode.

b. Point the camera at the test pattern and adjust optical focus for the sharpest possible picture.

c. Watch the screen of the monitor and adjust VR-1 for maximum resolution without overshoot or ringing appearing in the picture.

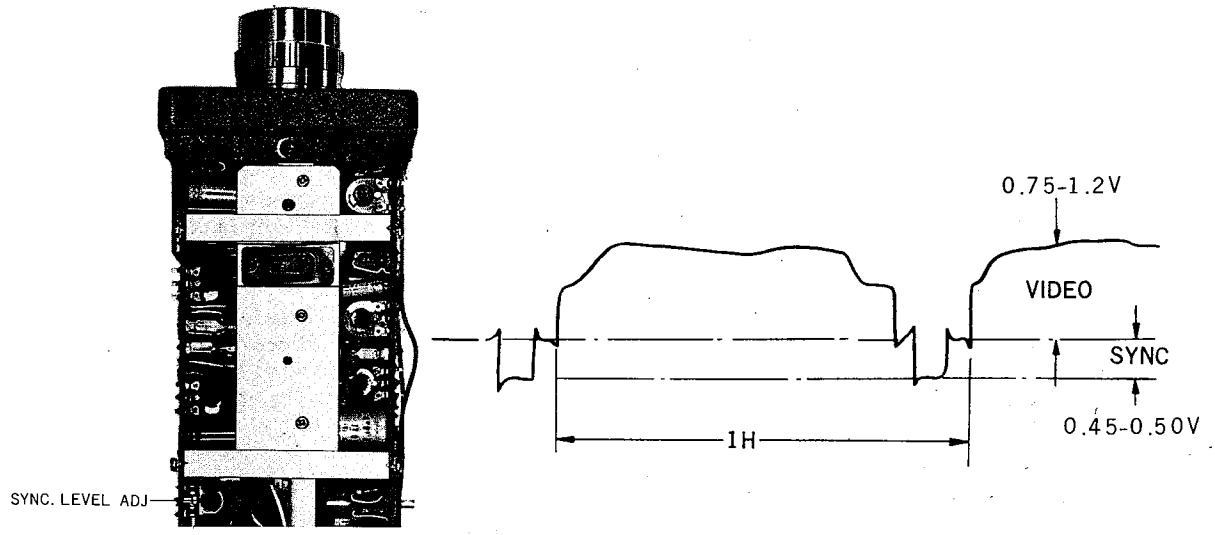


Fig. 3 6. SYNC LEVEL ADJUSTMENT.

3-7. DEFLECTION ADJUSTMENTS

Check B+, as described in Section 3-8, before making any adjustments to the deflection circuits. Place the camera in a test jig (see Section 4-1), or put the camera on the tripod and point the camera at the test card. The distance between the lens and the test card should be 2. 5 ft.

1. Vertical Size Adjustments

   a. Set up the camera to display video output on a monitor. See Section 4-2. Make sure that the monitor is not overscanned and has good linearity.

   b. Connect the vertical input leads of the scope between the V out terminal on the deflection board and ground.

   c. Adjust R131 HEIGHT for 3. 5 volts ± 0. 2 volts (p-p)

   d. Adjust R128 V LIN for best linearity on the display. Reset R131 if necessary to produce best linearity.

2. Vertical Frequency Adjustment (Factory Service Center)

Equipment required: Frequency counter HP-521 C or equivalent

   a. Connect the input lead of the counter to the V out terminal on the deflection board. See Fig 3-3 Connect the ground lead to the chassis.

   b. Turn on the counter. Set the Gate Selector to 1 sec.

   c. Turn on Camera. Allow five minutes for warmup. Set mode switch to VTR but disconnect VTR so that vertical oscillator runs free.

   d. Adjust VERTICAL FREQUENCY for a stable counter reading of 56 Hz (±1 Hz)

   e. Disconnect the counter.

   f. Check operation with the Videocorder as follows. Connect the camera to the Videocorder in the usual way. Set up the E-to-E mode and turn the motor on and off several times. Make sure that the camera locks up properly and has no vertical jitter or bounce, when the motor in the Videocorder is running.

   g. Lock R123 with white paint.

3. Vertical Frequency (Field Procedure)

   a. Connect the camera to the Videocorder and set up the camera E-to-E mode.

   b. Turn on the motor in the VTR. In the CV-2100 series, the motor will be running when the VTR is in the E-to-E mode.

   c. Observe the picture on the monitor and turn VERTICAL FREQUENCY R123 clockwise slowly. See Fig. 3-7. Stop clockwise rotation where the picture falls out of sync and appears to roll downwards erratically. Turn R123 counterclockwise from this position slightly.

   d. Lock R123 with white locking paint.

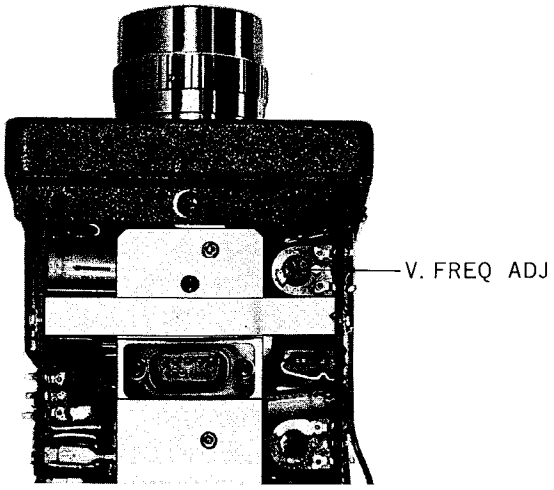


Fig. 3-7. VERTICAL FREQUENCY ADJUSTMENT.

4. Horizontal Size Adjustment

   a. Place the camera in the test jig (see Section 4-1) or point the camera at a test card located 2. 5 ft. from the lens.

   b. Connect the vertical-input lead of the scope to the H out terminal on the deflection board. See Fig. 3-3.

   c. Adjust R115 HORIZ OUT for a reading of 40 volts,(peak-to-peak).

   d. Observe the monitor and reset R115, if necessary for correct picture width.

5. Horizontal Frequency Adjustment (Factory Service Center)

Equipment required: Frequency Counter HP-521 C or equivalent.

   a. Connect the input lead of the counter to the H OUT terminal on the D board. See Fig 3-3. Connect the ground lead to the chassis.

   b. Turn on Camera. Allow five minutes for warmup. Set mode switch to VIDEO or RF.

   c. Adjust the core of L101 HOR FREQ for a counter reading of 15. 745 Hz ± 5 Hz. Note: Use a non-metallic screwdriver-type alignment tool to adjust L101. In some cases the core of L101 may be

sealed with wax. Dig out the wax carefully and make the adjustment. Reseal the core by softening the wax with a soldering iron.

6. Horizontal Frequency Adjustment (Field Procedure)

   a. Set up the camera with the Videocorder in the usual way. Turn on all equipment and allow a few minutes for warmup.

   b. Put the Videocorder in the E-to-E mode with the motor running.

   c. Turn the core of L101 clockwise until the picture falls out of sync. Then turn the core counterclockwise until the picture again falls out of sync. Set the core midway between the settings at which the picture falls out of sync.

3-8. POWER BOARD ADJUSTMENT

The regulated supply in the camera is set for a +14 volt output. Connect the positive probe of an accurate voltmeter to the power board as shown in Fig. 3-8. Connect the negative probe to chassis. Adjust R 205 to produce a reading of + 14 volts, ± 0. 2 volts.

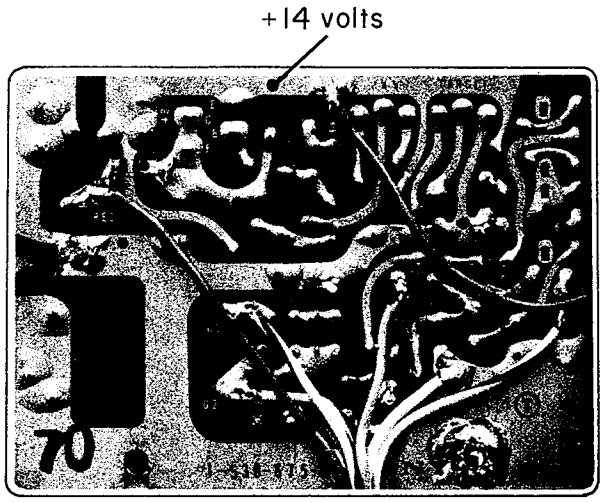


Fig. 3-8. WHERE TO MEASURE +14V.

SECTION 4
TROUBLESHOOTING NOTES

4-1. TEST JIG.

A test jig for use with SONY cameras is shown in Fig. 4-1. This jig accommodates CVC-2000-Series cameras and will also accept the CVC-2100A camera with the adaptor shown in the detail.

4-2. DIRECT MONITOR CONNECTIONS

Direct monitor connections are useful when making adjustments on the camera. The most convenient way to connect the camera directly to the monitor is by means of the cable shown in Fig. 4-2. This cable plugs into the VIDEO and RF OUT connector on the camera, and the camera should be switched to the VIDEO mode of operation. This hookup is particularly convenient for troubleshooting because the vertical oscillator in the camera is synchronized by the power frequency and your scope can be set for LINE SYNC.

Note: all output cables from the camera should be terminated in 75 ohms. If CVM-2300U, CVM-180U, CVM-220U or late model CVM-51 UWP monitors are used, set the termination switches on these monitors to ON. In this case the terminating resistor in the test cable may be omitted.

4-3. VIDEO CHECKS

The following tests will help to localize troubles in the video system.

a. Set up the camera with a monitor.

b. Turn on the camera and check the video output. If the output signal contains sync and blanking but no video, trouble is localized to the video circuits or the vidicon itself.

c. To localize the loss of video to the vidicon or the video amplifiers, place your finger near the target lead at the extreme lower left of the V board. If the video section is working, you will see a herringbone-type interference pattern on the screen of the monitor. This localizes trouble to the vidicon itself. If the pattern is not produced, trouble is localized to the video amplifier section.

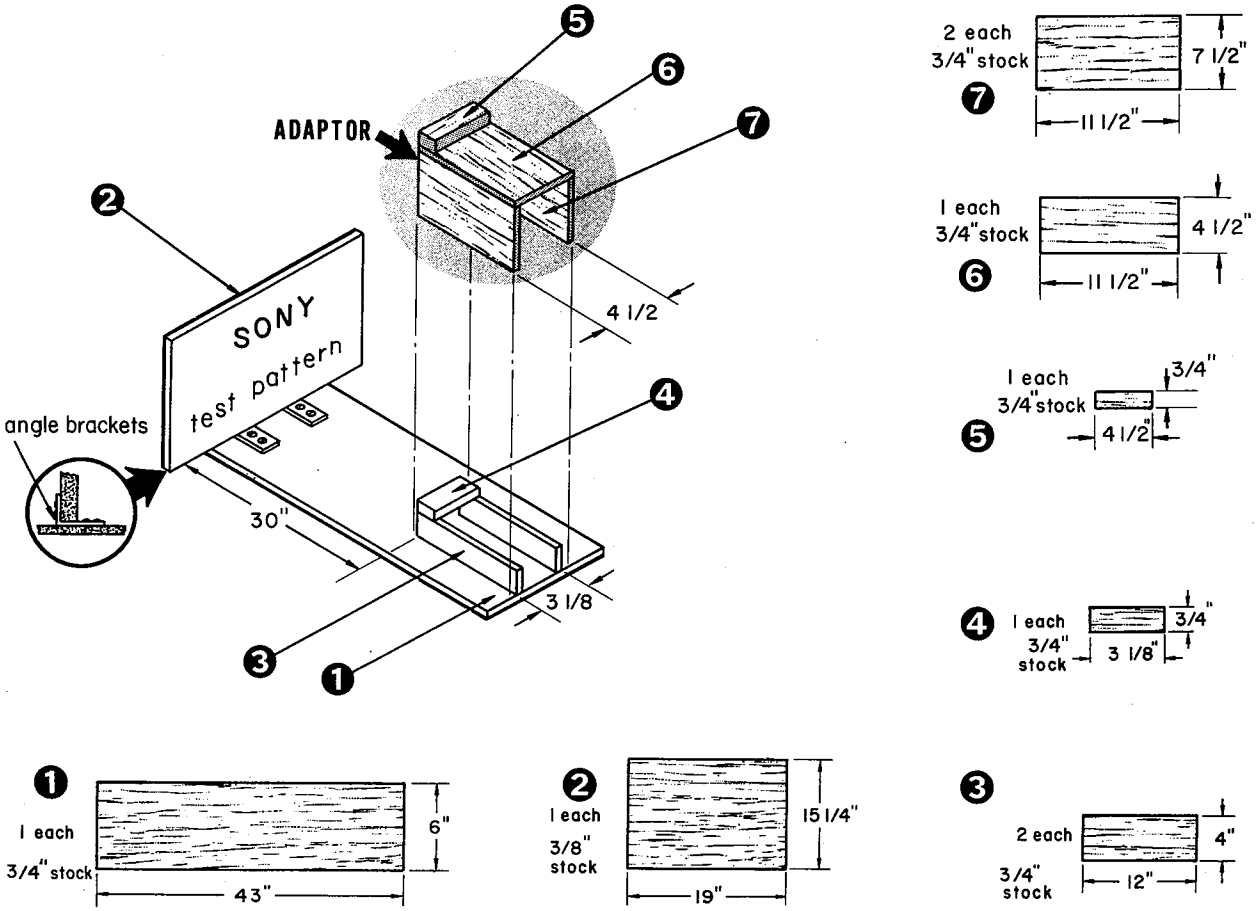


Fig. 4-1. CAMERA TEST JIG.

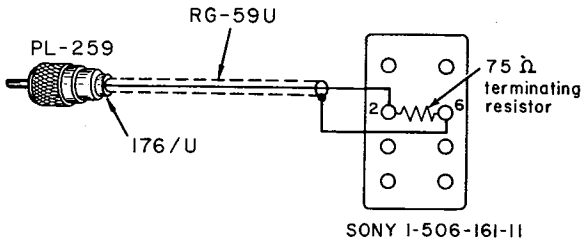


Fig. 4-2. TEST CABLE

d. If trouble is indicated on the vidicon, check to see that the vidicon has the necessary operating potentials. (20 V p-p)

Cathode,	pin 7	+1.3 v DC, (20 v (p-p)
G1,	pin 2	0 to 100 V (Depends upon BEAM setting)
G2,	pin 5	+450 V
G3,	pin 6	+250 V
Target*	Collector of X14	+40 to +70 V (See Fig. 4-3)

*Do not measure target voltage at the target ring. The voltmeter will load this voltage severely and the reading will be meaningless. Measure target voltage at its source - the collector of X14.

Figure 4-4 shows key waveforms in the video-processing circuits. Use this figure in signal tracing the video circuits.

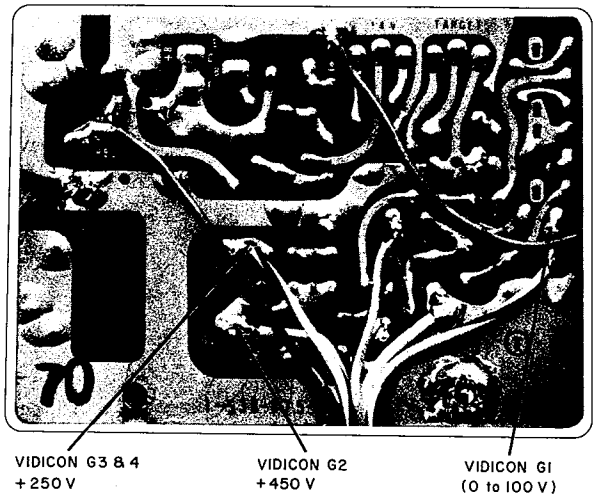


Fig. 4-3. WHERE TO MEASURE VIDICON VOLTAGES.

Figure 4-5 shows key waveforms in the deflection and sync circuits.

4-4. VIEWFINDER CONNECTOR

Figure 4-6 shows the connections and key drive signals at the 9-pin Viewfinder connector atop the camera.

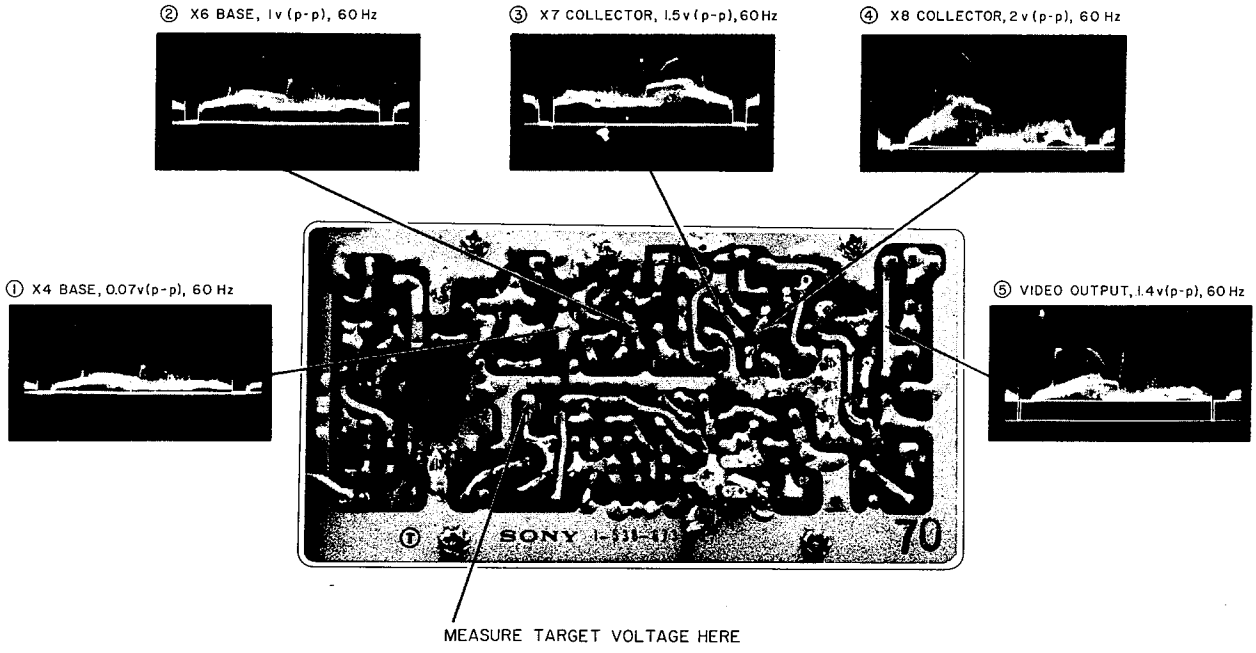

② X6 BASE, 1v (p-p), 60 Hz
③ X7 COLLECTOR, 1.5v (p-p), 60 Hz
④ X8 COLLECTOR, 2v (p-p), 60 Hz
① X4 BASE, 0.07v (p-p), 60 Hz
⑤ VIDEO OUTPUT, 1.4v (p-p), 60 Hz
MEASURE TARGET VOLTAGE HERE

Fig. 4-4. KEY VIDEO WAVEFORMS AND WHERE TO MEASURE DC TARGET VOLTAGE.

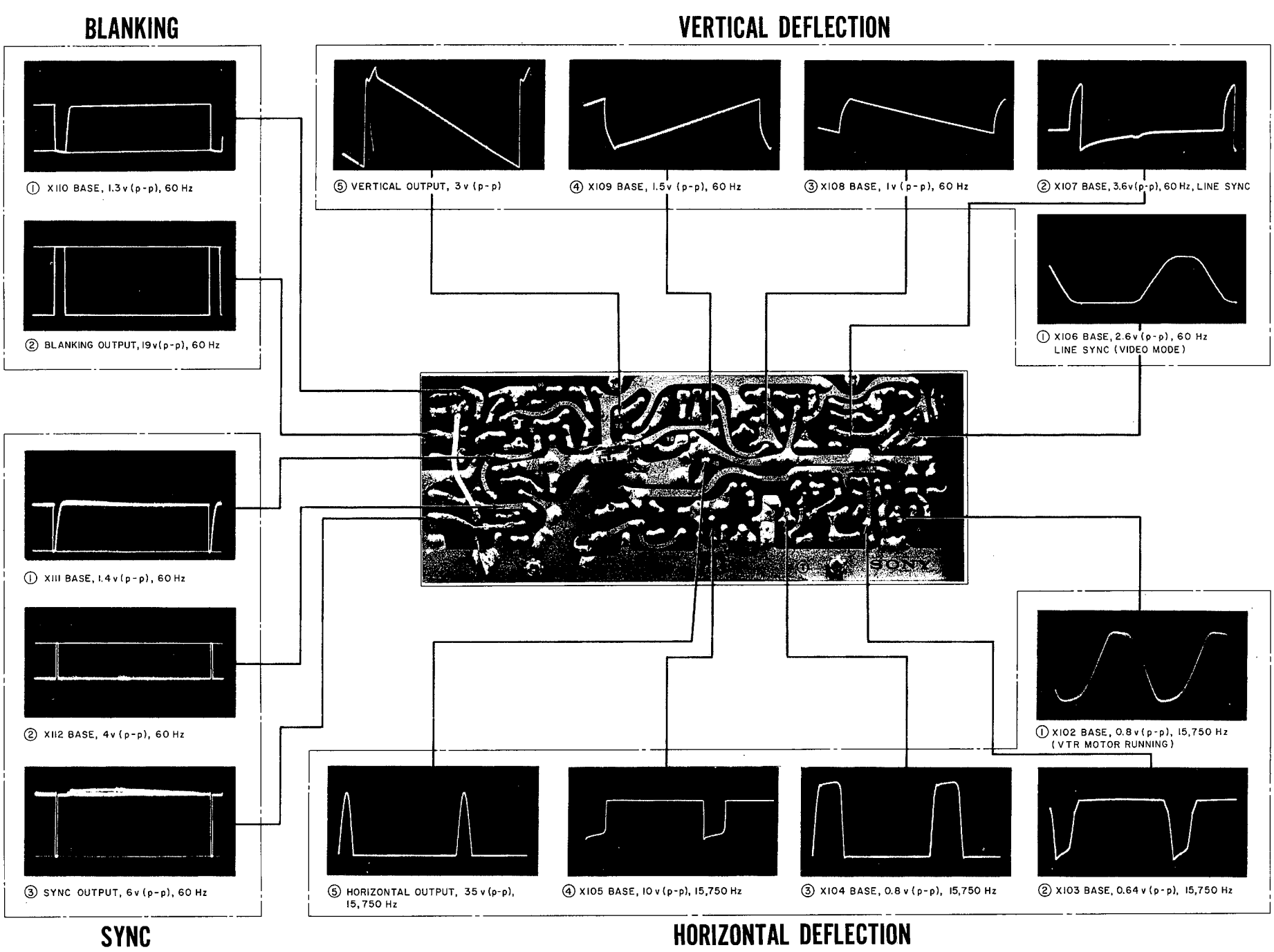
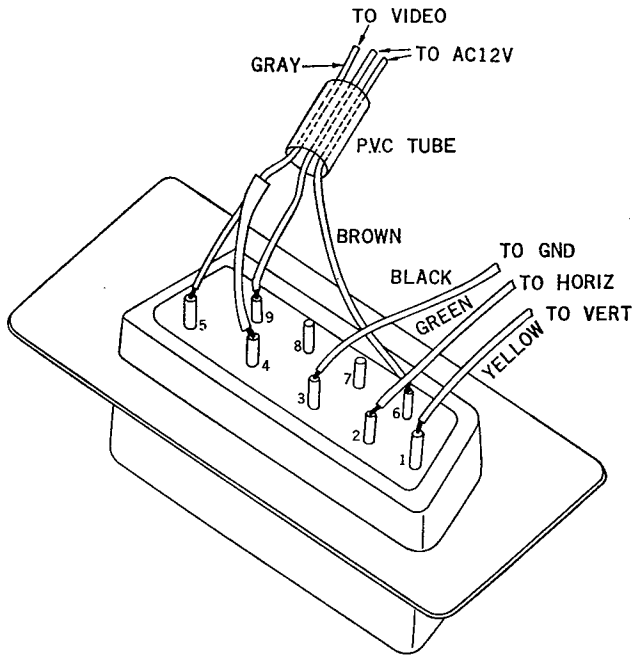
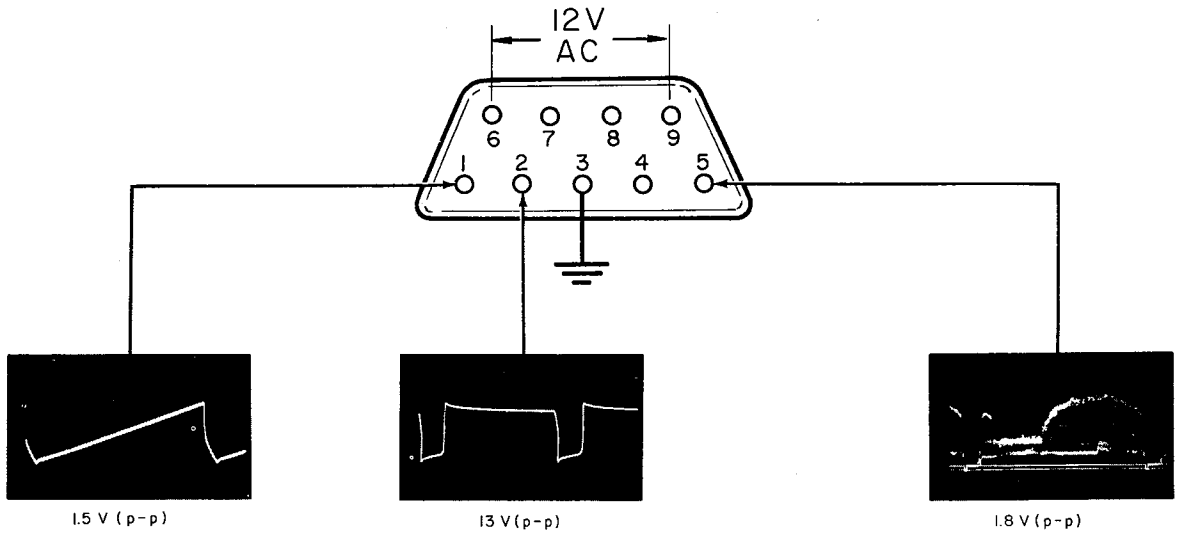

BLANKING
VERTICAL DEFLECTION
① X110 BASE, 1.3v (p-p), 60 Hz
② BLANKING OUTPUT, 19v (p-p), 60 Hz
⑤ VERTICAL OUTPUT, 3v (p-p)
④ X109 BASE, 1.5v (p-p), 60 Hz
③ X108 BASE, 1v (p-p), 60 Hz
② X107 BASE, 3.6v (p-p), 60 Hz, LINE SYNC
① X106 BASE, 2.6v (p-p), 60 Hz
LINE SYNC (VIDEO MODE)
① X111 BASE, 1.4v (p-p), 60 Hz
② X112 BASE, 4v (p-p), 60 Hz
③ SYNC OUTPUT, 6v (p-p), 60 Hz
① X102 BASE, 0.8v (p-p), 15,750 Hz
(VTR MOTOR RUNNING)
⑤ HORIZONTAL OUTPUT, 35v (p-p), 15,750 Hz
④ X105 BASE, 10v (p-p), 15,750 Hz
③ X104 BASE, 0.8v (p-p), 15,750 Hz
② X103 BASE, 0.64v (p-p), 15,750 Hz
SYNC
HORIZONTAL DEFLECTION

Fig. 4-5. KEY DEFLECTION WAVEFORMS.



BOTTOM VIEW



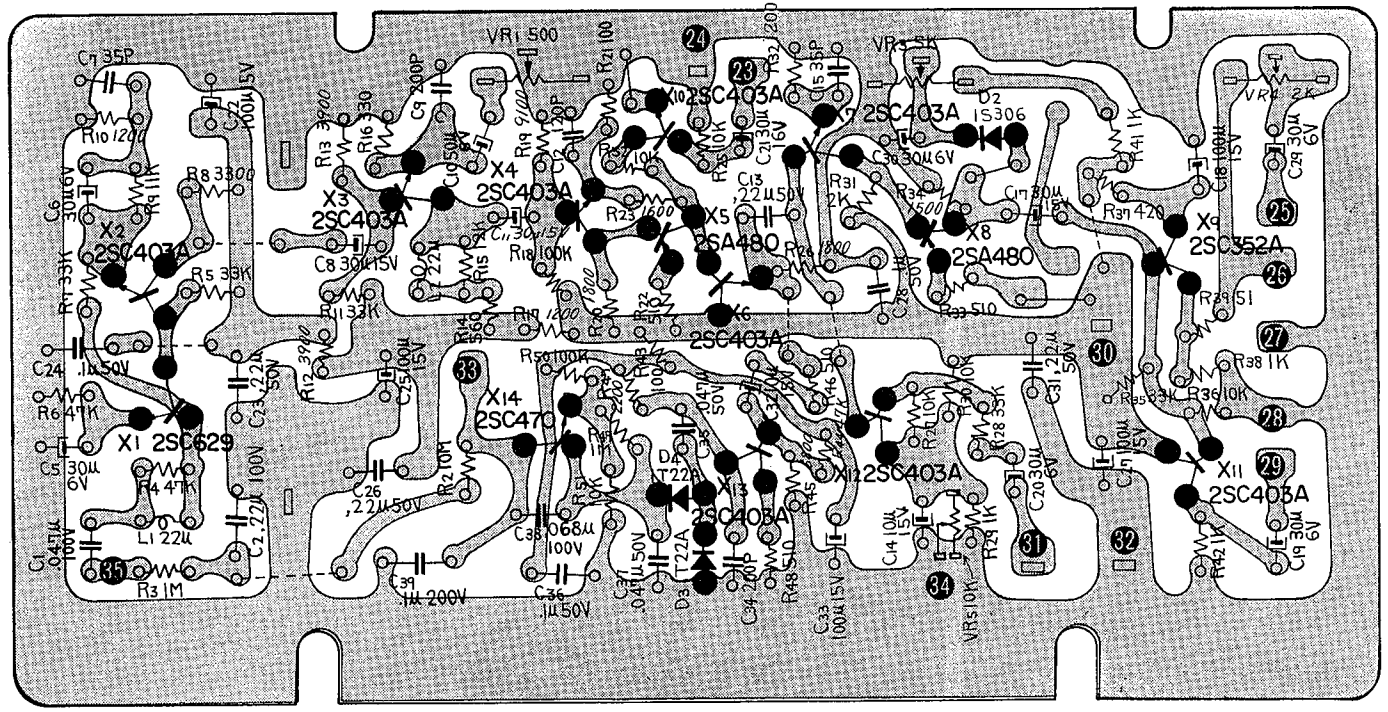
TOP VIEW

Fig. 4-6. VIEWFINDER CONNECTOR AND SUPPLY SIGNALS.

SECTION 5

PRINTED CIRCUIT BOARDS

5-1. "V" CIRCUIT BOARD CONDUCTOR SIDE (VIDEO BLOCK)



ADJUSTMENTS

VR1	E — 2
VR3	G — 2
VR4	J — 2
VR5	H — 3

TRANSISTORS

X1	B — 4
X2	B — 3
X3	C — 2
X4	E — 2
X5	E — 3
X6	F — 3
X7	F — 2
X8	G — 3
X9	J — 3
X10	E — 2
X11	J — 4
X12	G — 4
X13	F — 4
X14	E — 4

DIODES

D2	H — 2
D3	F — 5
D4	F — 4

(23) — TO D CIRCUIT BOARD R147

(24)

(25) YEL — TO D CIRCUIT BOARD X112 COLLECTOR

(26) BLK — FROM S2

(27)

(28) BLK

(29) — FROM 9P CONNECTOR NO5

(30) RED — TO P CIRCUIT BOARD +B

(31) BLU — TO D CIRCUIT BOARD X111 COLLECTOR

(32) BLK — TO P CIRCUIT BOARD GND

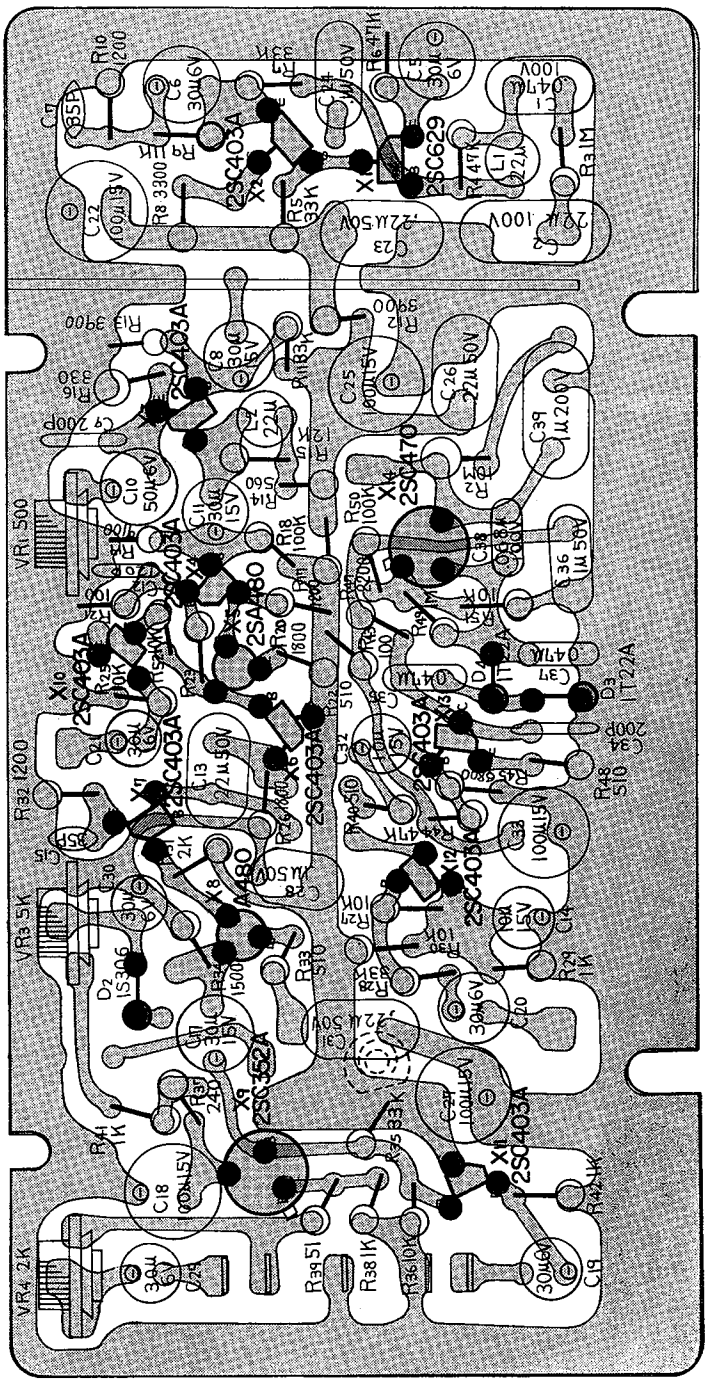
(33) WHT — TO P CIRCUIT BOARD R215

(34) BLK — FROM LUG TERMINAL OF VIDICON SHIELD COVER

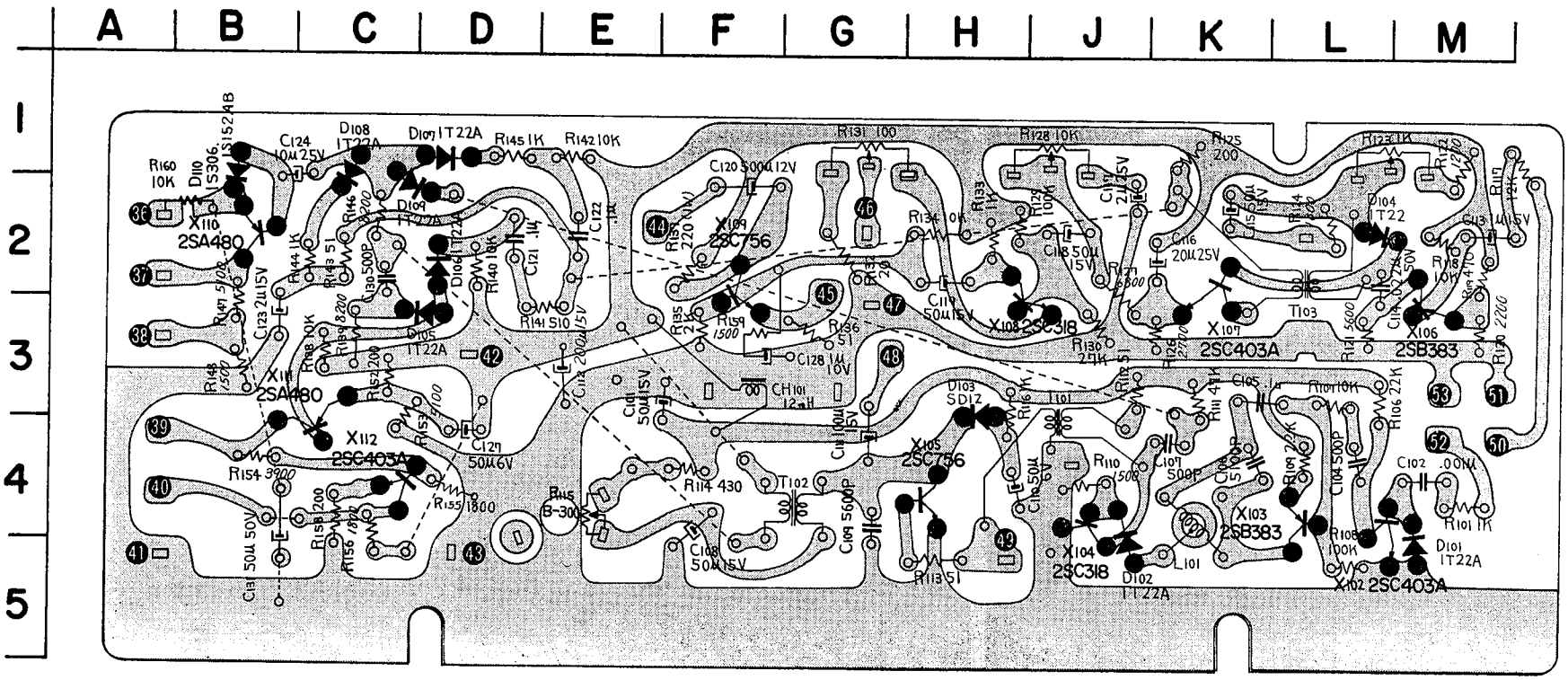
(35) YEL — FROM TARGET

VR5 MOUNTED ON THE PRINTED SIDE.

"V" CIRCUIT BOARD COMPONENT SIDE



5-2. "D" CIRCUIT BOARD CONDUCTOR SIDE (DEFLECTION BLOCK)



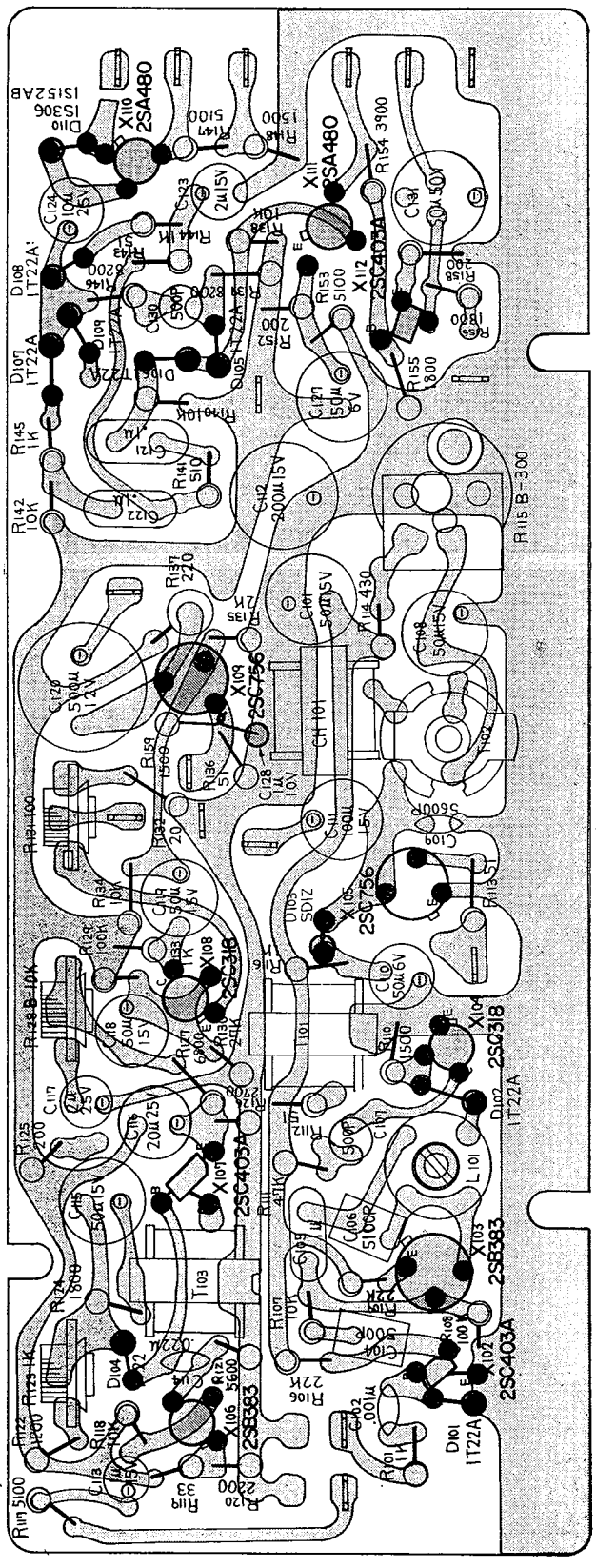
ADJUSTMENTS		TRANSISTORS		DIODES	
R_{115}	E — 4	X_{102}	M — 5	D_{101}	M — 4
R_{123}	L — 1	X_{103}	K — 4	D_{102}	J — 4
R_{128}	J — 1	X_{104}	J — 4	D_{103}	H — 3
R_{131}	G — 1	X_{105}	H — 4	D_{104}	L — 2
		X_{106}	M — 3	D_{105}	D — 3
		X_{107}	K — 2	D_{106}	D — 2
		X_{108}	J — 2	D_{107}	D — 1
		X_{109}	F — 2	D_{108}	C — 1
		X_{110}	B — 2	D_{109}	C — 1
		X_{111}	C — 3	D_{110}	B — 1
		X_{112}	C — 4		

R_{160} MOUNTED ON THE PRINTED SIDE.

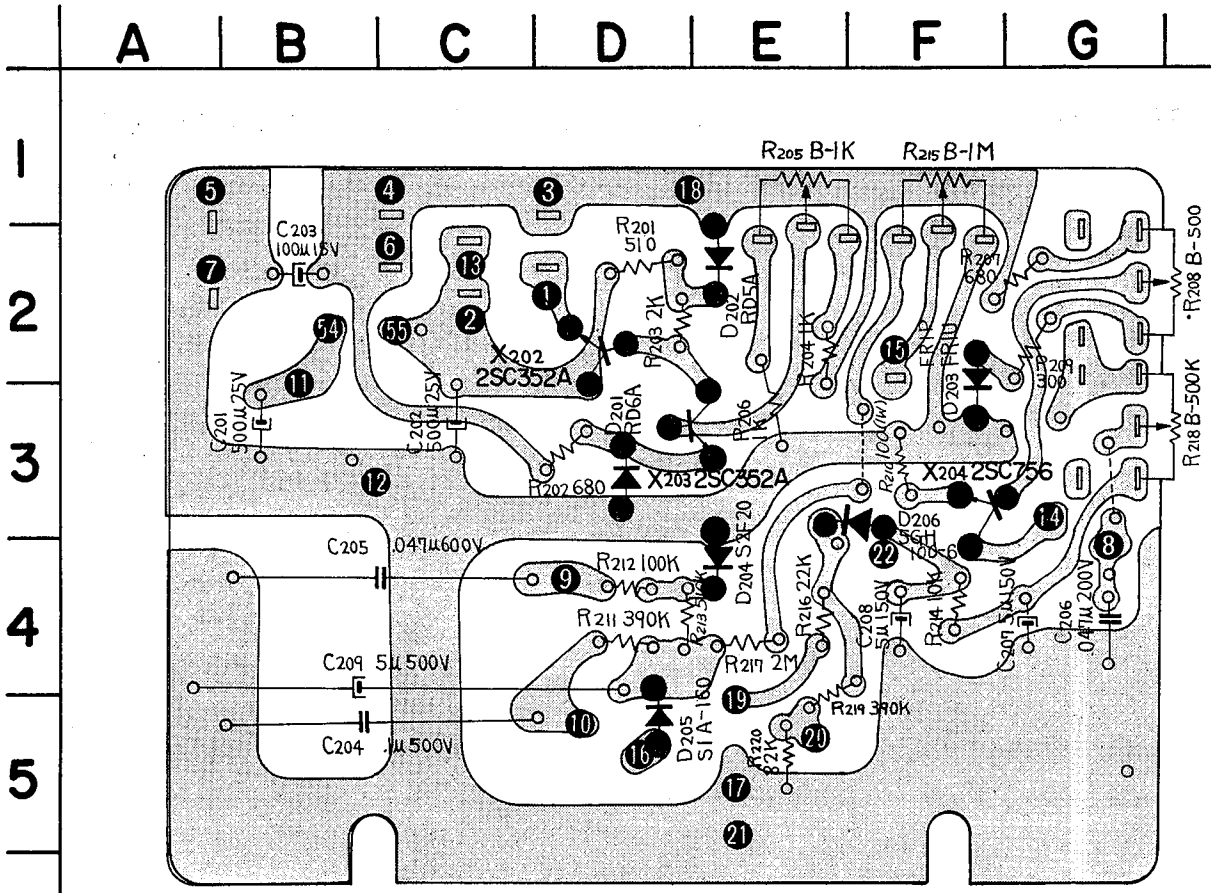
36 — ORG — TO X_{201} COLLECTOR
37 — GRY — FROM VIDICON CATHODE
38 — BLK — TO V CIRCUIT BOARD C_{21}
39 — BLU — TO V CIRCUIT BOARD C_{20}
40 — YEL — TO V CIRCUIT BOARD C_{29}
41 — BLK — TO P CIRCUIT BOARD GND
42 — RED — TO P CIRCUIT BOARD + B
43 — BLU — FROM HORIZONTAL DEFLECTION COIL
44 — YEL — FROM VERTICAL DEFLECTION COIL

45 — YEL — FROM 9P CONNECTOR NO 1
46 — GRN — FROM VERTICAL DEFLECTION COIL
47 — BLK — FROM 9P CONNECTOR NO 3
48 — RED — FROM HORIZONTAL DEFLECTION COIL
49 — GRN — FROM 9P CONNECTOR NO 2
50 — BLU — FROM S_3
51 — BLU ----
52 — RED — FROM S_4
53 — RED ----

"D" CIRCUIT BOARD COMPONENT SIDE



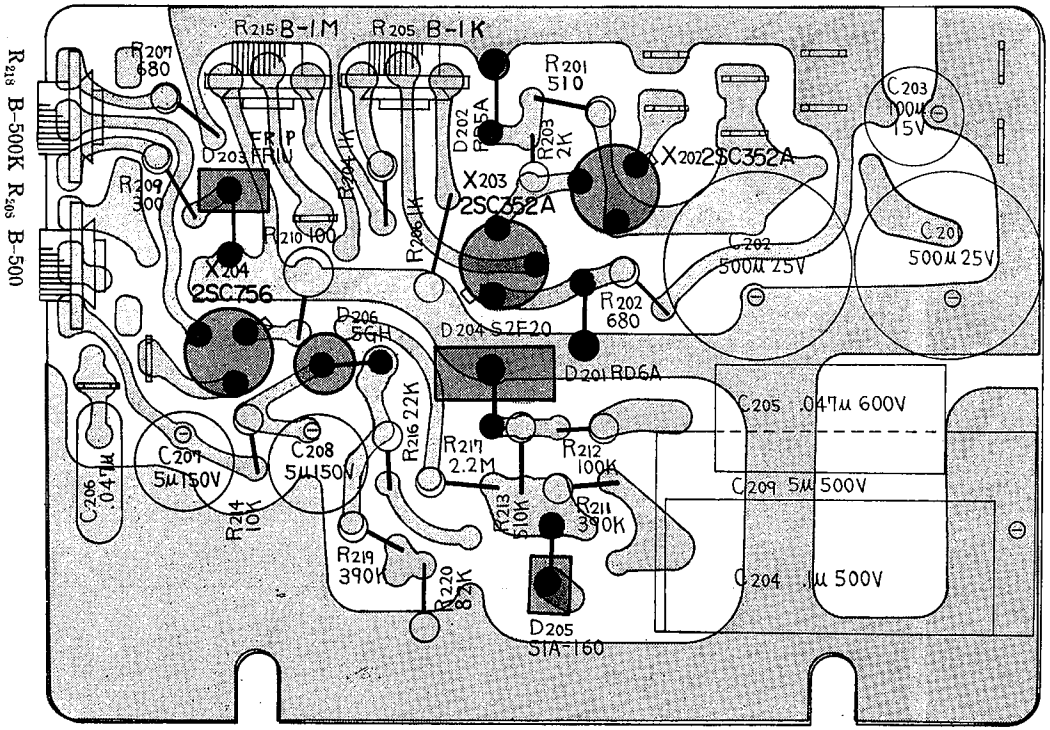
5-3. "P" CIRCUIT BOARD CONDUCTOR SIDE (POWER SUPPLY BLOCK)



ADJUSTMENTS		TRANSISTORS		DIODES	
R_{205}	E—2	X_{202}	D—2	D_{201}	D—3
R_{208}	G—2	X_{203}	E—3	D_{202}	E—2
R_{215}	F—2	X_{204}	F—3	D_{203}	F—3
R_{218}	G—3			D_{204}	E—4
				D_{205}	D—5
				D_{206}	F—3

1. YEL — TO X_{201} BASE
2. ORG — TO X_{201} COLLECTOR
3. RED — TO X_{201} EMITTER
4. RED — TO V CIRCUIT BOARD + B
5. BLK — TO V CIRCUIT BOARD GND
6. RED — TO D CIRCUIT BOARD + B
7. BLK — TO D CIRCUIT BOARD GND
8. WHT AND GRN — FROM VIDICON G_1
9. WHT AND BLU — FROM VIDICON $G_{3,4}$
10. WHT AND BRN — FROM VIDICON G_2
11. RED — FROM SELENIUM
12. BLK — FROM SELENIUM GND
13. RED — TO D CIRCUIT BOARD R_{160}
14. WHT — FROM FOCUS COIL
15. WHT — TO V CIRCUIT BOARD X_{14} COLLECTOR
16. RED — POWER TRANSFORMER 300V LEAD
17. BLK — FROM NEON LAMP
18. RED — FROM S_1
19. RED — FROM NEON LAMP
20. BLU — FROM S_3
21. WHT — POWER TRANSFORMER 0V LEAD
22. ORG — POWER TRANSFORMER 70V LEAD
54. — TO CHOKE COIL
55. — TO CHOKE COIL

"P" CIRCUIT BOARD COMPONENT SIDE

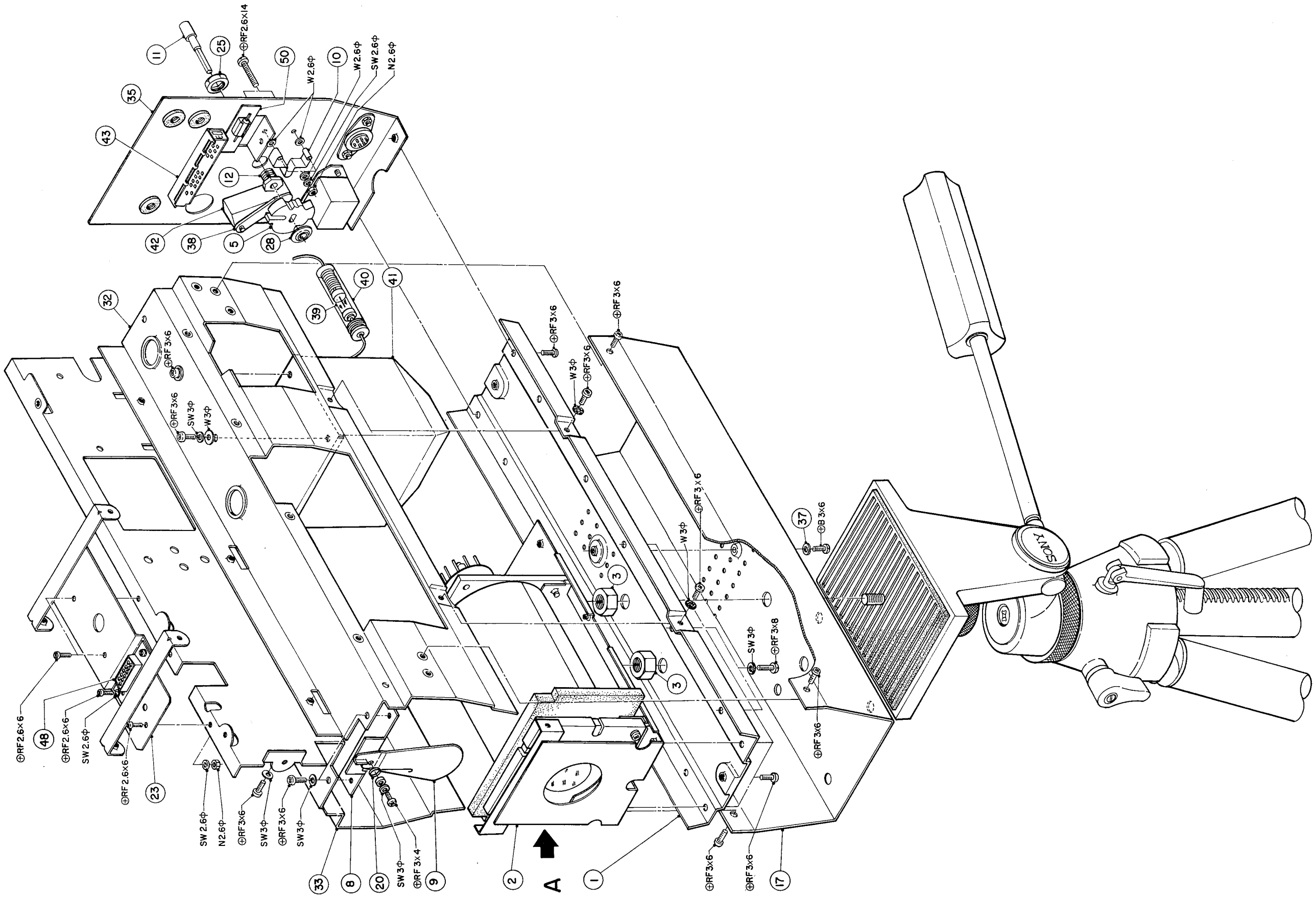


SECTION 6

6-1. TRANSISTOR VOLTAGE CHART

	B	C	E	Location
X1	5.2	5.8	4.7	E - 2
X2	5.8	7.6	5.2	F - 2
X3	1.0	10.5	0.5	F - 2
X4	1.0	12.0	0.4	G - 2
X5	12.0	4.7	12.6	G - 2
X6	4.7	14.1	1.7	H - 2
X7	1.1	13.0	0.6	J - 2
X8	13.0	0.3	13.5	J - 2
X9	2.1	11.1	1.4	K - 2
X10	−1.1	1.0	0	G - 3
X11	2.1	14.0	1.5	L - 2
X12		1.1		H - 3
X103	13.7	−4.2	13.8	K - 4
X104	0.03	13.5	0	L - 4
X105	−0.8	2.9	0	M - 4
X107	6.7	13.6	7.5	N - 6
X108	1.5	6.6	0.8	P - 6
X109	1.9	8.1	1.4	R - 6
X110			21.0	P - 4
X111	13.9	1.1	13.4	R - 4
X112	0.2	12.0	0.2	R - 4
X201	14.5	27.8	14.0	D - 4
X202	15.0	27.8	14.5	D - 4
X203	6.2	15.0	5.5	D - 4
X204	5.8	13.0	5.2	E - 4

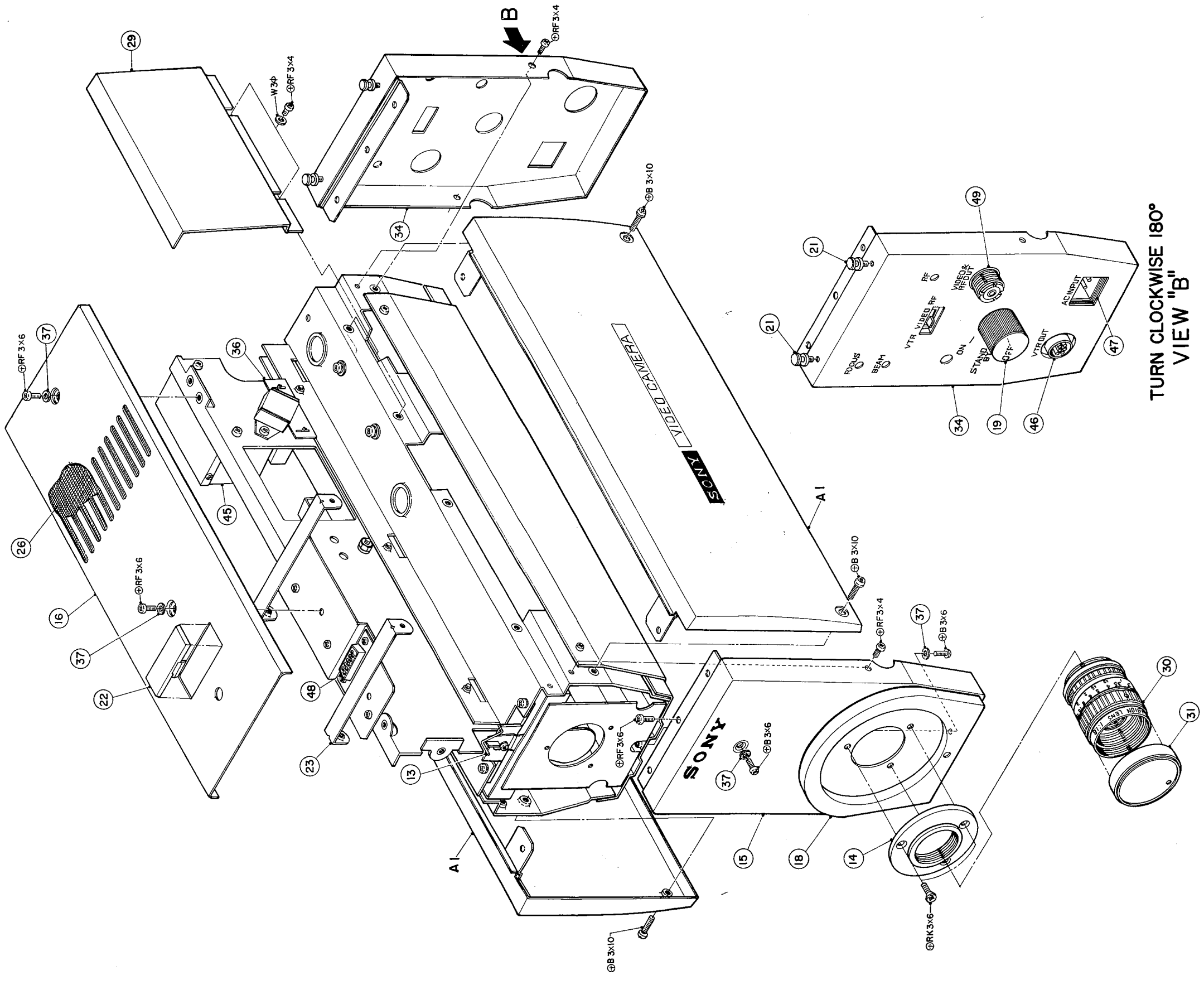
7-2. INSIDE TRIM



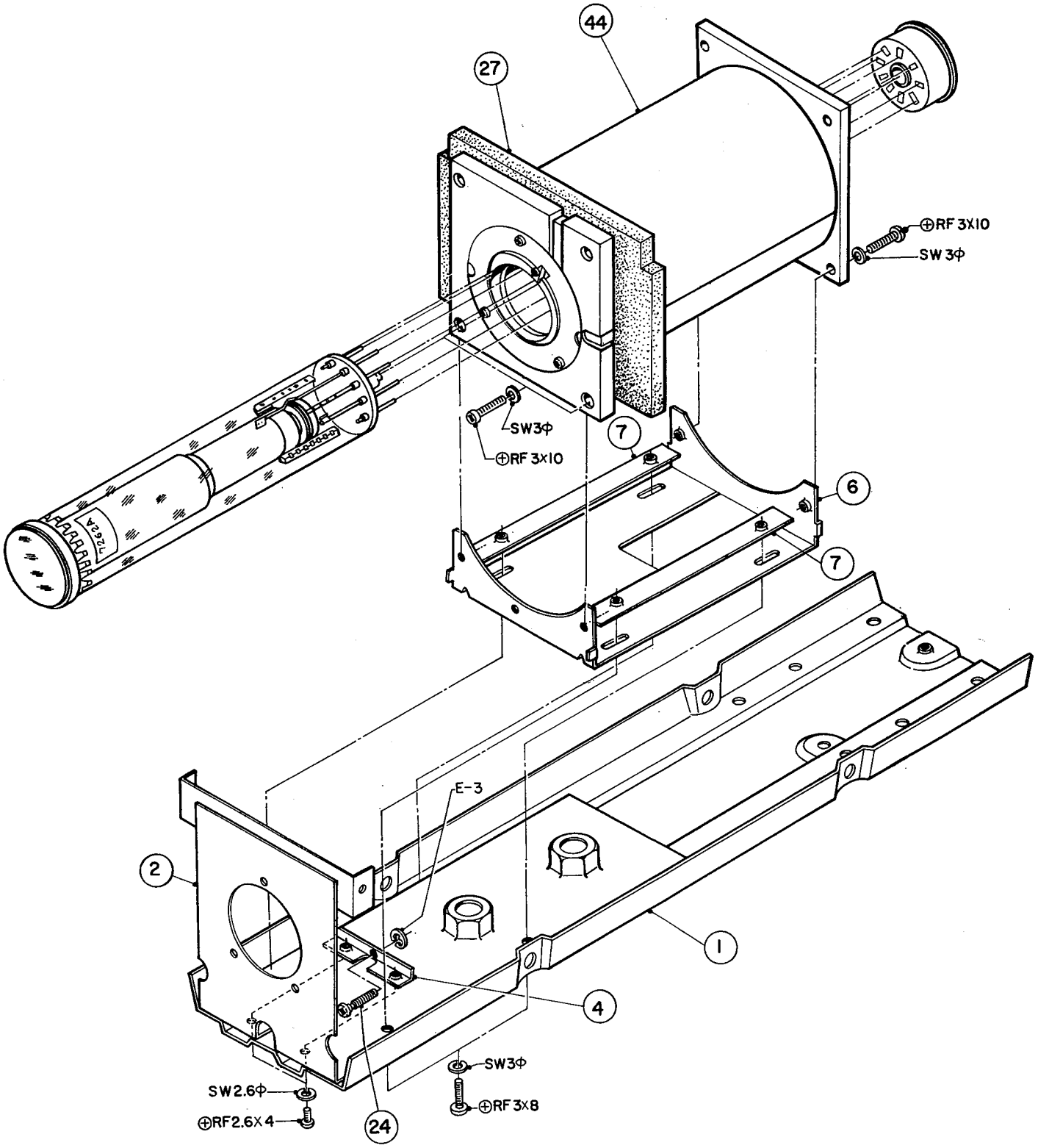
SECTION 7

EXPLODED DIAGRAM

7-1. OUTSIDE TRIM



7-3. VIDICON MOUNTING SYSTEM



DETAIL "A"

SECTION 8

Complete Parts List for CVC-2100A (UL)

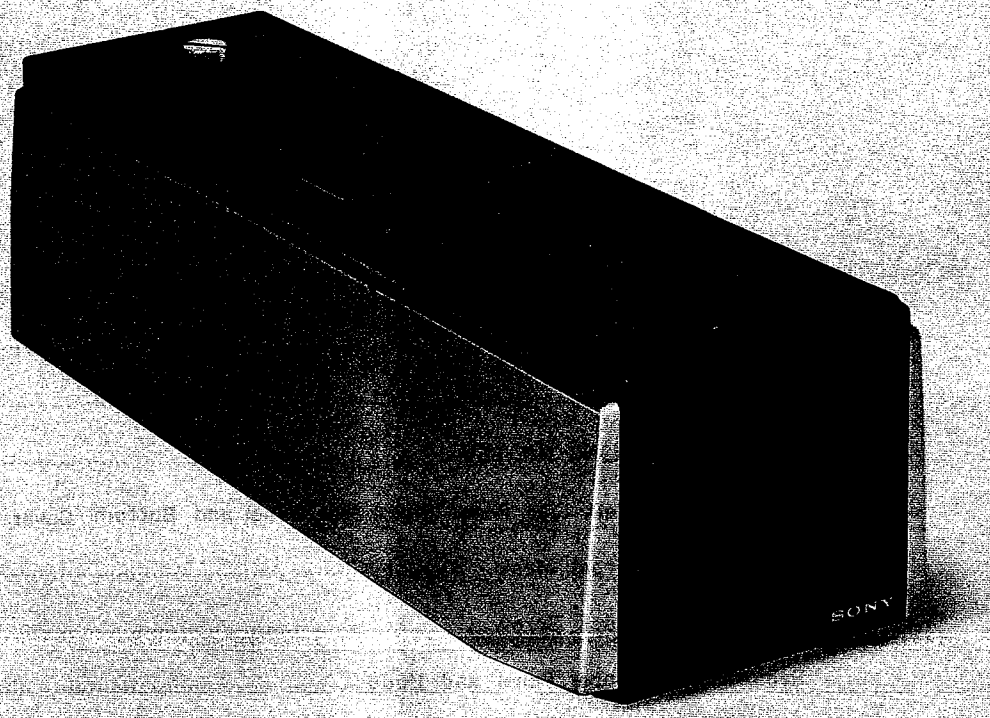
Ref. No.	Part No.	Description
	A. Mechanical Parts	
A-1	X-20420-05-01	Side Panel Ass'y, including
	2-042-024-00	Side Panel
	-040-02	Reinforcing Plate, side panel
1	-006-03	Bottom Plate
2	-007-02	Holding Plate
3	-009-02	Nut
4	-010-00	Fixing Plate, deflection yoke
5	-011-00	Cam
6	-012-01	Supporter, deflection yoke
7	-013-00	Holding Metal, deflection yoke
8	-014-01	Holding Plate, shutter
9	-015-00	Shutter Plate
10	-016-00	Leaf Spring
11	-017-02	Shaft, cam
12	-018-00	Receptacle, cam shaft
13	-019-01	Shaft
14	-020-01	Frame, lens mount
	-021-02	Spacer
15	-022-03	Front Panel
16	-026-01	Cover (1)
17	-027-01	〃 (2)
18	-028-00	Spacer, lens mount
19	-031-02	Knob, switch
20	-034-01	Spring, shutter
21	-035-02	Stopper, viewfinder
22	-036-02	Cap, socket
23	-037-02	Supporter, printed board
24	-038-00	Screw, flange back
25	-039-00	Nut, cam shaft
26	-044-00	Wire Netting
27	-045-01	Light-intercepting cushion
28	-048-00	Push Nut, shaft 4ϕ
	-049-00	Speed Nut 3ϕ (Screw type)
29	-052-01	Insulator
	-053-01	Adhesive Sheet
	-055-01	Shield Plate
30	-056-00	Standard Lens (CVC-2100UL)
31	-057-00	Cap, lens
32	-060-02	Chassis (1)
33	-061-02	〃 (2)
34	-063-00	Back Panel
35	-064-00	Holding Plate, connector
36	2-030-503-01	Holding Plate, choke
	2-034-693-03	Allen Type Screw 3×8
37	3-103-947-00	Panel Washer
	2-042-069-01	Specification Label
	4-008-364-02	Caution Label
	3-124-385-00	Sleeve, plug
38	3-605-041-01	Adjusting Plate, micro switch
	3-822-634-01	Heat Sink
	Screw	
	7-621-259-25	(+) RF 2.6×4
	-45	(+) RF 2.6×6
	-49	(+) RF 2.6×6
	-85	(+) RF 2.6×14
	-261-25	(+) RF 3×4
	-45	(+) RF 3×6
	-55	(+) RF 3×8
	-65	(+) RF 3×10
	-661-49	(+) RK 3×6
	-770-49	(+) B 3×6
	-51	(+) B 3×10
	Nut	
	7-622-107-01	2.6ϕ
	-108-01	3ϕ
	Washer	
	7-623-107-02	2.6ϕ (small)
	-108-12	3ϕ (medium)
	Spring Washer	
	7-623-207-11	2.6ϕ
	-208-11	3ϕ
	7-623-408-01	3ϕ Star Washer
	-508-01	3ϕ Grounding Lug
	7-624-104-01	Retaining Ring E-2
	7-623-606-01	Eyelet 1.3×3
	B. Electrical Parts	
	Video Block	
V	1-538-673-13	Printed Circuit Board V
	1-506-163-11	Connecting Plug
	Micro Inductor	
L1	1-407-026-11	22uH
L2	-026-11	〃
	Adjustable Resistor	
VR1	1-221-601-11	B-500 ohms
VR3	-604-11	B-5K 〃
VR4	-603-11	B-2K 〃
VR5	-359-11	B-10K 〃

Ref. No.	Part No.	Description
	Transistor	
X1		2SC629
X2		2SC403A
X3		2SC403A
X4		2SC403A
X5		2SA480
X6		2SC403A
X7		2SC403A
X8		2SA480
X9		2SC352A
X10		2SC403A
X11		〃
X12		〃
X13		〃
X14		2SC470
	Diode	
D2		1S306
D3		1T22A
D4		〃
	Resistor	
R2	1-201-812-11	10M ohms ±5% RD½BF Solid
R3	-600-11	1M 〃 〃 〃 〃
R4	1-242-713-31	47K 〃 〃 RD¼UR Carbon
R5	-709-11	33K 〃 〃 〃 〃
R6	-713-31	47K 〃 〃 〃 〃
R7	-709-11	33K 〃 〃 〃 〃
R8	-685-31	3.3K 〃 〃 〃 〃
R9	-698-31	11K 〃 〃 〃 〃
R10	-675-31	1.2K 〃 〃 〃 〃
R11	-709-11	33K 〃 〃 〃 〃
R12	-687-11	3.9K 〃 〃 〃 〃
R13	-687-11	3.9K 〃 〃 〃 〃
R14	-667-11	560 〃 〃 〃 〃
R15	-699-11	12K 〃 〃 〃 〃
R16	-661-11	330 〃 〃 〃 〃
R17	-675-11	1.2K 〃 〃 〃 〃
R18	-721-09	100K 〃 〃 〃 〃
R19	-696-31	9.1K 〃 〃 〃 〃
R20	-679-31	1.8K 〃 〃 〃 〃
R21	-649-11	100 〃 〃 〃 〃
R22	-666-11	510 〃 〃 〃 〃
R23	-678-31	1.6K 〃 〃 〃 〃
R25	-697-11	10K 〃 〃 〃 〃
R26	-679-31	1.8K 〃 〃 〃 〃
R27	-697-09	10K 〃 〃 〃 〃
R28	-709-11	33K 〃 〃 〃 〃
R29	-673-09	1K 〃 〃 〃 〃
R30	-697-09	10K 〃 〃 〃 〃
R31	-680-31	2K ohms ±5% RD¼UR carbon
R32	-675-31	1.2K 〃 〃 〃 〃
R33	-666-11	510 〃 〃 〃 〃
R34	-677-11	1.5K 〃 〃 〃 〃
R35	-709-11	33K 〃 〃 〃 〃
R36	-697-11	10K 〃 〃 〃 〃
R37	1-204-465-11	240 〃 〃 RD½SP 〃
R38	1-242-673-09	1K 〃 〃 RD¼UR 〃
R39	1-202-542-11	50 〃 〃 RC½ 〃
R41	-673-09	1K 〃 〃 RD¼UR 〃
R42	-673-09	1K 〃 〃 〃 〃
R43	-649-11	100 〃 〃 〃 〃
R44	-713-31	47K 〃 〃 〃 〃
R45	-693-11	6.8K 〃 〃 〃 〃
R46	-666-11	510 〃 〃 〃 〃
R47	-681-31	2.2K 〃 〃 〃 〃
R48	-666-11	510 〃 〃 〃 〃
R49	1-201-600-11	1M 〃 〃 RC½BF Solid
R50	1-242-721-09	100K 〃 〃 RC¼UR Carbon
R51	-697-31	10K 〃 〃 〃 〃
R52	-697-09	10K 〃 〃 〃 〃
	Capacitor	
C1	1-105-721-12	0.047μF ±10% 100V Mylar
C2	-729-12	0.22μF 〃 200V 〃
C5	1-121-284-11	30μF 6V Electrolytic
C6	-284-11	〃 6V 〃
C7	1-107-120-11	36PF Mica
C8	1-121-138-11	30μF $^{+150\%}_{-10\%}$ 15WV Electrolytic
C9	1-107-138-11	200PF Mica
C10	1-121-135-11	50μF 6WV Electrolytic
C11	-138-11	30μF $^{+150}_{-10}$% 15WV 〃
C12	1-107-133-11	120PF Mica
C13	1-105-689-11	0.22μF ±10% 50WV Mylar
C14	1-121-192-11	10μF 15WV Electrolytic
C15	1-107-120-11	36PF Mica
C17	-138-11	30μF 〃 15WV Electrolytic
C18	-356-11	100μF 〃 〃 〃
C19	-284-11	30μF 6WV 〃
C20	-284-11	〃 〃 〃
C21	-138-11	〃 $^{+150}_{-10}$% 15WV 〃
C22	-356-11	100μF 〃 〃 〃
C23	1-105-689-12	0.22μF ±10% 50WV Mylar
C24	-685-12	0.1μF 〃 〃 〃
C25	1-121-356-11	100μF $^{+150}_{-10}$% 15WV Electrolytic
C26	1-105-689-11	0.22μF ±10% 50WV Mylar
C27	1-121-356-11	100μF $^{+150}_{-10}$% 15WV Electrolytic

Ref. No.	Part No.	Description
C28	1-105-685-12	0.1μF ±10% 50WV Mylar
C29	1-121-284-11	30μF 6WV Electrolytic
C30	-284-11	〃 〃 〃
C31	1-105-689-12	0.22μF ±10% 50WV Mylar
C32	1-121-192-11	10μF 15WV Electrolytic
C33	-356-11	100μF $^{+150}_{-10}$% 〃 〃
C34	1-107-138-11	200PF Mica
C35	1-105-681-11	0.047μF ±10% 50WV Mylar
C36	-685-11	0.1μF 〃 〃 〃
C37	-681-11	0.047μF 〃 〃 〃
C38	-723-12	0.068μF 〃 100WV 〃
C39	-765-11	0.1μF 〃 200WV 〃
	Deflection Block	
	1-538-674-13	Printed Circuit Board D
	1-506-163-11	Connecting Plug
CH101	1-421-251-11	Horizontal Choke Coil
L101	1-435-032-11	Horizontal Oscillator Coil
	Transformer	
T101	1-437-008-11	Horizontal Driver
T102	1-439-026-11	〃 Output
T103	1-435-014-12	Vertical Oscillator
	Transistor	
X102		2SC403A
X103		2SC383
X104		2SC318
X105		2SC756
X106		2SB383
X107		2SC403A
X108		2SC318
X109		2SC756
X110		2SA480
X111		〃
X112		2SC403A-4
	Diode	
D101		1T22A
D102		〃
D103		SD-1Z
D104 ~ D109		1T22A
D110		IS306
	Carbon Resistor	
R101	1-242-673-11	1K ohm ±5% RD¼UR
R106	-705-11	22K ohms 〃 〃
R107	-697-11	10K 〃 〃 〃
R108	-721-11	100K ohms ±5% RD¼UR
R109	-656-11	200 〃 〃 〃
R110	-677-11	1.5K 〃 〃 〃
R111	-713-11	47K 〃 〃 〃
R112	-642-11	51 〃 〃 〃
R113	-642-11	51 〃 〃 〃
R114	1-204-509-11	430 〃 〃 RD½SP
R115	1-225-088-11	B-300 〃 Adjustable
R116	1-242-673-11	1K ohm ±5% RD¼UR
R117	-690-11	5.1K 〃 〃 〃
R118	-697-11	10K 〃 〃 〃
R119	-637-11	33 〃 〃 〃
R120	-681-11	2.2K 〃 〃 〃
R121	-691-11	5.6K 〃 〃 〃
R122	-675-11	1.2K 〃 〃 〃
R123	1-221-602-11	B-1K 〃 Adjustable Resistor
R124	1-242-679-11	1.8K 〃 ±5% RD¼UR
R125	-656-11	200 〃 〃 〃
R126	-683-11	2.7K 〃 〃 〃
R127	-693-11	6.8K 〃 ±10% 〃
R128	1-221-605-11	B-10K 〃 Adjustable Resistor
R129	1-242-721-11	100K 〃 ±5% RD¼UR
R130	-707-31	27K 〃 ±10% 〃
R131	1-221-468-11	B-100 〃 Adjustable Resistor
R132	1-242-632-11	20 〃 ±5% RD¼UR
R133	-673-11	1K 〃 〃 〃
R134	-697-11	10K 〃 〃 〃
R135	-680-11	2K 〃 〃 〃
R136	-642-11	51 〃 〃 〃
R137	1-204-522-11	220 〃 〃 RD1SP
R138	1-242-697-11	10K 〃 〃 RD¼UR
R139	-695-11	8.2K 〃 〃 〃
R140	-697-11	10K 〃 〃 〃
R141	-666-11	510 〃 〃 〃
R142	-697-11	10K 〃 〃 〃
R143	-642-11	51 〃 〃 〃
R144	-673-11	1K 〃 〃 〃
R145	-673-11	1K 〃 〃 〃
R146	-695-11	8.2K 〃 〃 〃
R147	-690-11	5.1K 〃 〃 〃
R148	-677-11	1.5K 〃 〃 〃
R152	1-242-656-11	200 〃 〃 〃
R153	-690-11	5.1K 〃 〃 〃
R154	-687-11	3.9K 〃 〃 〃
R155	-679-11	1.8K 〃 〃 〃
R156	-679-11	1.8K 〃 〃 〃
R158	-656-11	200 〃 〃 〃
R159	-677-11	1.5K 〃 〃 〃
R160	-697-11	10K 〃 〃 〃

Ref. No.	Part No.	Description
	Capacitor	
C101	1-121-139-11	50μF $^{+150}_{-10}$% 15WV Electrolytic
C102	1-105-661-12	0.001μF ±10% 50WV Mylar
C104	1-103-058-12	500PF 〃 35WV Polystyrol
C105	1-105-685-12	0.1μF 〃 Mylar
C106	1-103-079-12	5000PF 〃 35WV Polystyrol
C107	1-107-007-11	500PF Silvered Mica
C108	1-121-139-11	50μF $^{+150}_{-10}$% 15WV Electrolytic
C109	1-105-670-12	0.0056μF ±10% 50WV Mylar
C110	1-121-135-11	50μF 6WV Electrolytic
C111	-082-11	100μF 〃 〃
C112	-173-11	200μF 〃 〃
C113	-174-11	1μF 15WV 〃
C114	1-105-677-12	0.022μF ±10% 50WV Mylar
C115	1-121-139-11	50μF $^{+150}_{-10}$% 15WV Electrolytic
C116	-570-11	20μF ±20% 25WV 〃
C117	-231-11	2μF 〃 〃 〃
C118	-139-11	50μF $^{+150}_{-10}$% 15WV 〃
C119	-139-11	〃 〃 〃 〃
C120	-147-11	500μF $^{+80}_{-20}$% 12WV 〃
C121	1-105-685-12	0.1μF ±10% 50WV Mylar
C122	-685-12	〃 〃 〃 〃
C123	1-121-270-11	2μF 15WV Electrolytic
C124	-283-11	10μF 25WV 〃
C127	-135-11	50μF 6WV 〃
C128	-174-11	1μF 15WV 〃
C130	1-101-007-11	500PF Silvered Mica
C131	1-121-386-11	50μF 50WV Electrolytic
	Power Block	
	1-538-675-13	Printed Circuit Board P
	1-506-163-11	Connecting Plug
	1-519-007-15	Neon Tube
	Transistor	
X201		2SD47
X202		2SC352A
X203		2SC352A
X204		2SC756
	Diode	
D201		RD6A
D202		RD5A
D203		FR1U
D204		S2F20
D205		SIA-150
D206		5GH
	Carbon Resistor	
R201	1-242-666-11	510 ohms ±5% RD¼UR
R202	-669-11	680 〃 〃 〃
R203	-680-11	2K 〃 〃 〃
R204	-673-11	1K 〃 〃 〃
R205	1-221-602-11	B-1K 〃 Adjustable
R206	1-242-673-11	1K 〃 ±5% RD¼UR
R207	-669-11	680 〃 〃 〃
R208	1-221-972-11	500 〃 Adjustable
R209	1-242-660-11	300 〃 ±5% RD¼UR
R210	1-204-521-11	100 〃 〃 RD1SP
R211	1-201-788-11	390K 〃 〃 RC½BF composition Resistor
R212	1-242-721-11	100K 〃 〃 RD¼UR
R213	1-201-834-11	510K 〃 〃 RC½BF composition Resistor
R214	1-242-697-11	10K 〃 〃 RD¼UR
R215	1-221-407-11	B-1M 〃 Adjustable
R216	1-242-705-11	22K 〃 ±5% RD¼UR
R217	1-202-652-11	2M 〃 〃 RC½ composition Resistor
R218	1-221-971-11	B-500K ohms Adjustable
R219	1-242-735-11	390K 〃 ±5% RD¼UR
R220	-719-11	82K 〃 〃 〃
	Capacitor	
C201	1-121-099-11	500μF 25WV Electrolytic
C202	-099-11	〃 〃 〃
C203	-082-11	100μF 15WV 〃
C204	1-117-048-11	0.1μF ±20% 500WV Metalized Paper
C205	1-117-038-11	0.05μF ±20% 600WV Metalized Paper
C206	1-105-761-12	0.047μF ±20% 200WV Mylar
C207	1-121-246-11	5μF $^{+150}_{-10}$% 150WV Electrolytic
C208	-246-11	〃 〃 〃 〃
C209	1-119-030-11	〃 500WV 〃
	Chassis Block	
CH201	1-421-132-12	Filter Choke
D207 ~ D210	1-531-011-11	Selenium Rectifier
39	1-532-009-00	Fues
40	1-533-007-01	Holder, fuse
41	1-441-341-14	Power Transformer
42	1-514-039-12	Micro Switch
43	-335-11	Slide Switch
44	1-451-038-13	Deflection Coil
45	1-463-003-12	VHF Oscillator (CVC-2100A)
	1-507-080-11	Connecting Jack
46	1-508-055-11	6P Socket
47	1-509-115-12	AC Socket
48	-140-11	9P Socket
49	-158-11	Coaxial Connector
50	1-517-032-11	Socket, lamp
	1-525-203-11	Vidicon
	1-526-059-11	Socket, vidicon
C309	1-129-233-31	56PF ±10% 250WV Mica

CVF-4



Specifications

Picture tube:	4″, 50-degree deflection, aluminized screen. CT-465
Transistors:	10 (including Silicon and Germanium types)
Diodes:	10 (including Zener diode)
Video input signal:	1.0 Vp-p, impedance 5K ohms
Horizontal drive input signal:	15.75/15.625 Hz (5 Vp-p)
Vertical drive input signal:	60/50 Hz (1 Vp-p)
Resolutions:	More than 300 lines
Video S/N ratio:	Greater than 40 db
Power requirements:	AC 12 V, 60/50 Hz, 6 watt
Dimensions:	3⅝″ (H)×4¼″ (W)×12¼″ (D) (92×107×313 mm)
Weight:	3 lbs. 12 oz. (1.7 Kg)

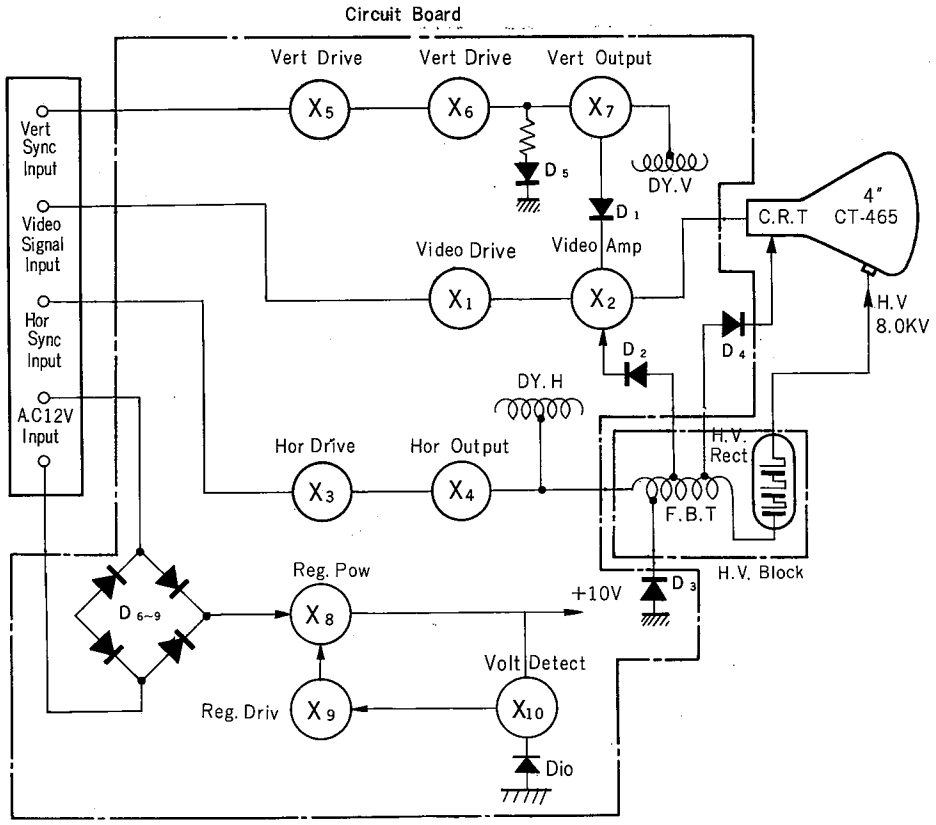
SONY®

SERVICE MANUAL

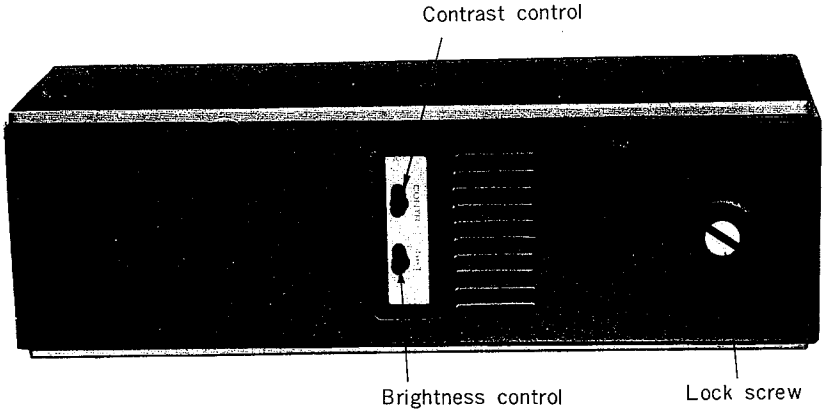
TABLE OF CONTENTS

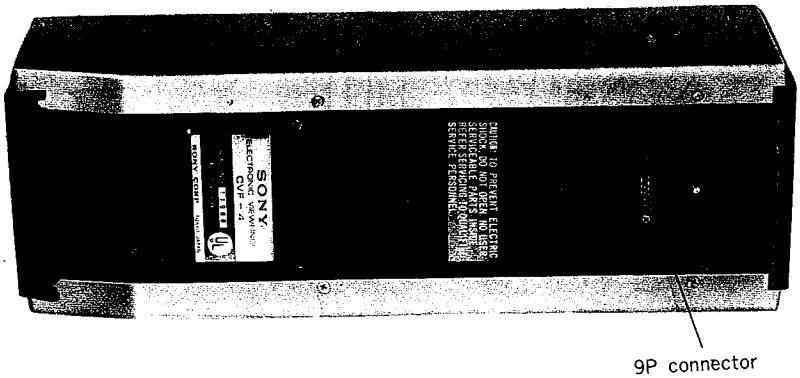
	Page
Specifications for the SONY Viewfinder CVF 4	1
BLOCK DIAGRAM	3
EXTERNAL VIEW	3
METHOD OF DISASSEMBLING THE SET	4
Removal of the Left Side Panel, Right Side Panel and Bottom Cover	4
Removal of the Front Mask	4
Removal of the Lock Screw	5
Removal of the Upper Panel and Hood	6
Removal of the Deflection Circuit Board	6
Removal of the Picture Tube	7
ADJUSTMENT	
Circuit Board Adjustments	8~9
MOUNTING DIAGRAM	
Conductor Side	10
Component Side	10
EXPLODED DIAGRAM	11~12
SCHEMATIC DIAGRAM	14

Block Diagram



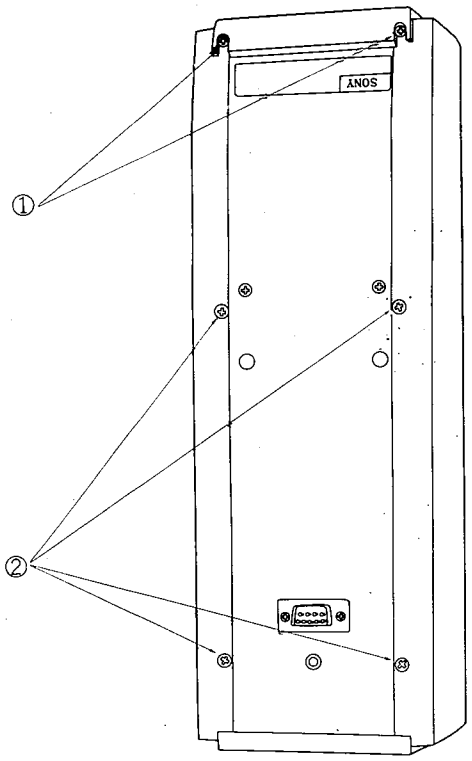
External View



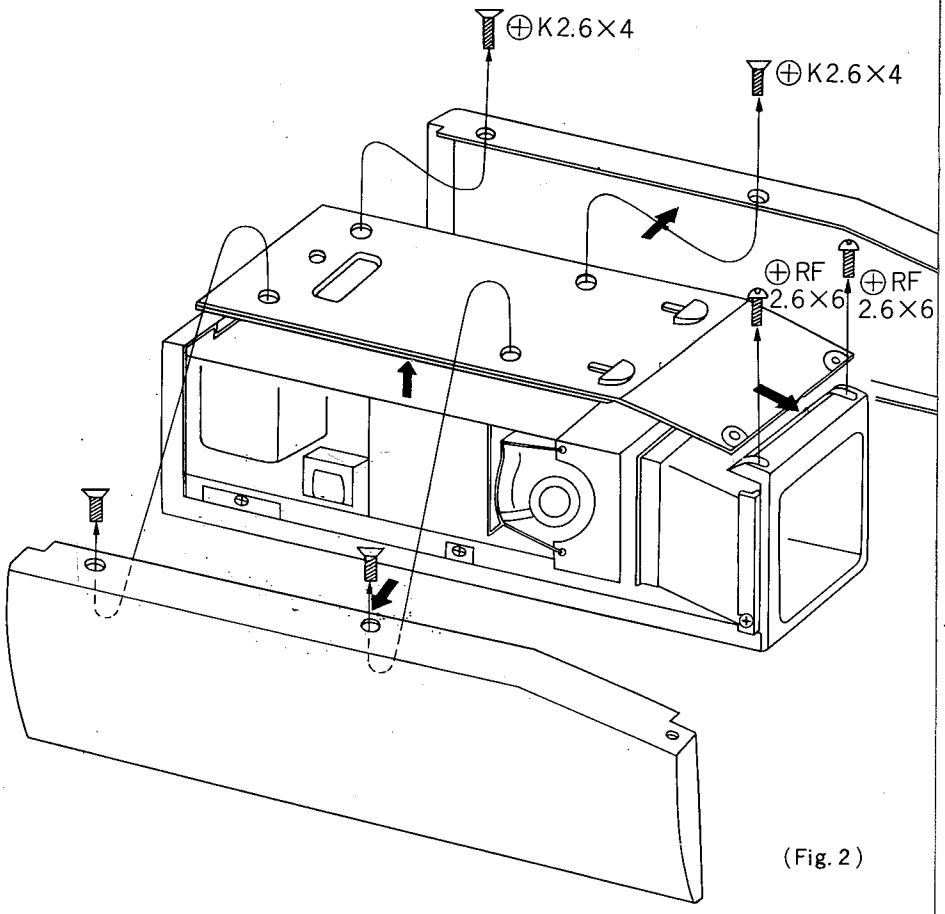


To Remove the Left Side Panel, Right Side Panel and Bottom Cover

(1) Remove the Six Screws (①, ② in Fig. 1, 2).



(Fig. 1)

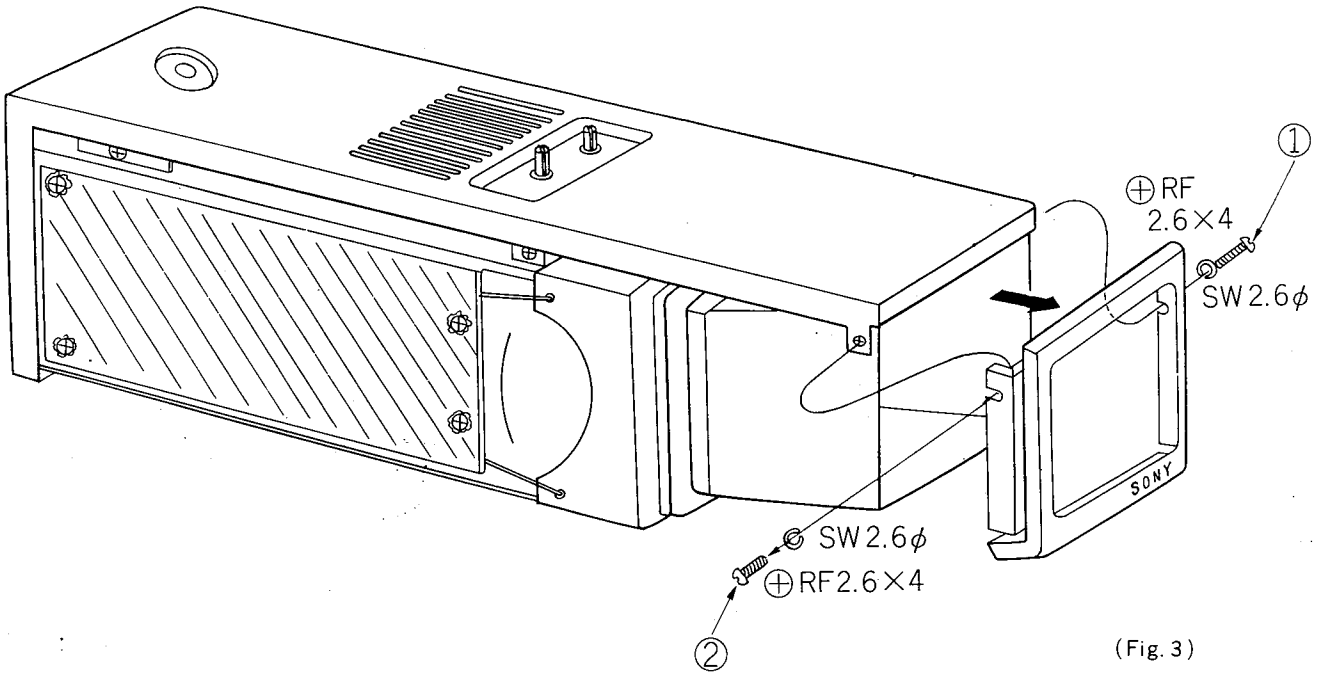


(Fig. 2)

To Remove the Front Mask

(1) Remove the Left Side Panel, Right Side Panel and Bottom Cover.

(2) Remove the two Screws (① ② in Fig. 3).

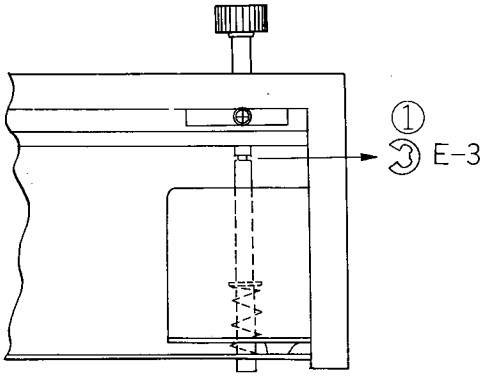


(Fig. 3)

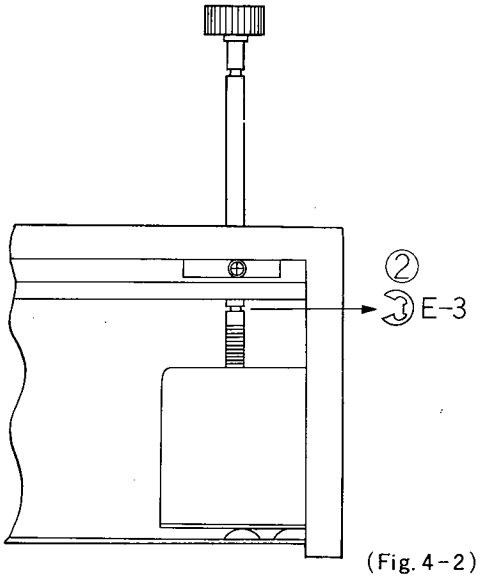
To Remove the Lock Screw

(1) Remove the two Retaining Ring (① ② in Fig. 4)

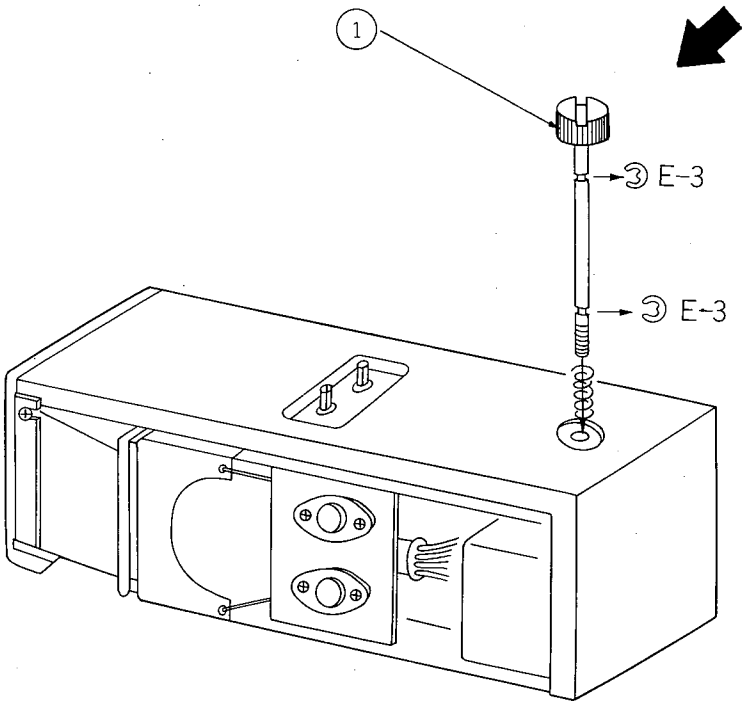
(2) Pull Lock Screw straight out (① in Fig. 5).



(Fig. 4-1)



(Fig. 4-2)

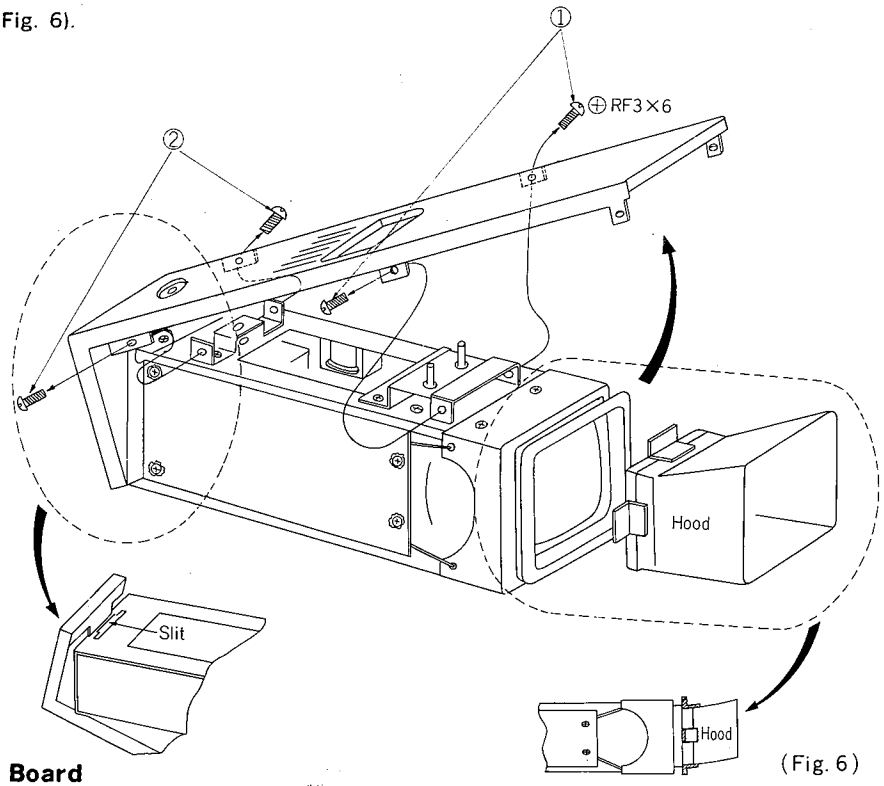


(Fig. 5)

Method of Disassembling the Set

To Remove the Upper Panel and Hood

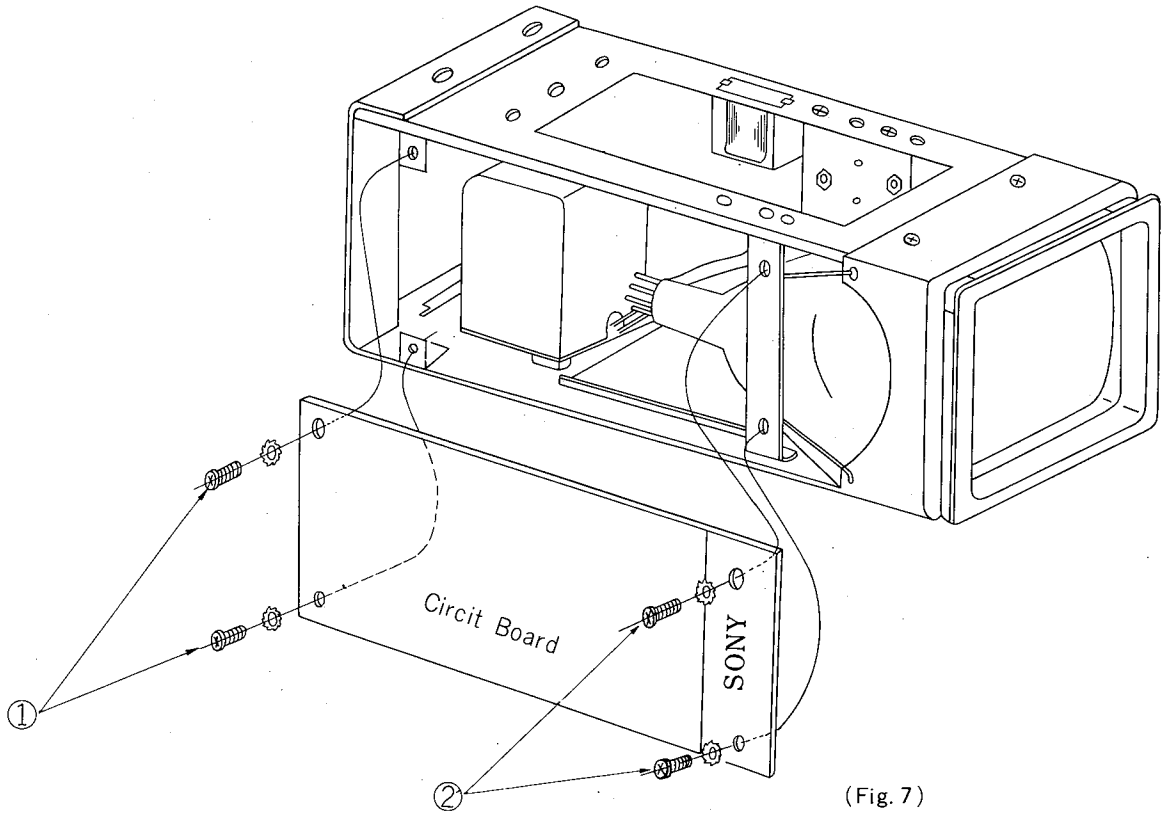
(1) Remove the Left Side Panel, Right Side Panel and Bottom Cover
(2) Remove the Lock Screw.
(3) Remove the four Screws (① ②in Fig. 6).



(Fig. 6)

To Remove the Deflection Circuit Board

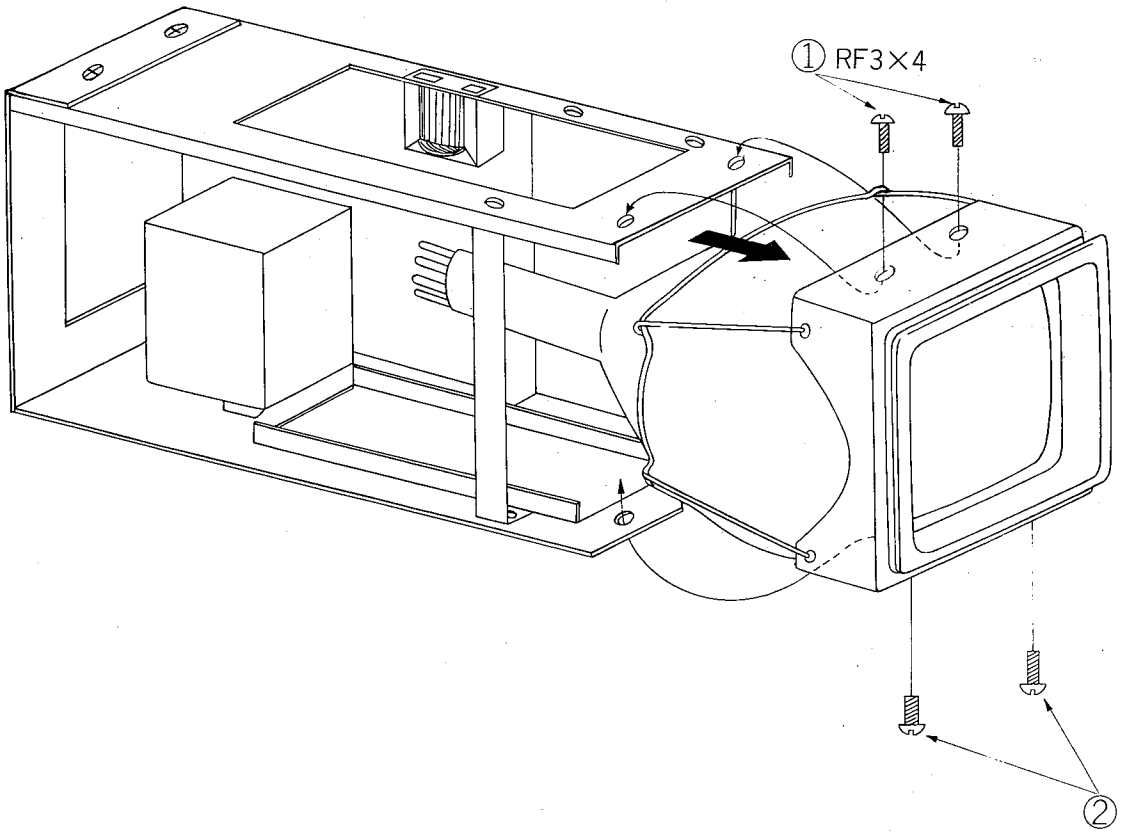
(1) Remove the Left Side Panel.
(2) Remove the four Screws (① ② in Fig. 7).
(3) Remove the all the Corresponding Leads on the Circuit Board.



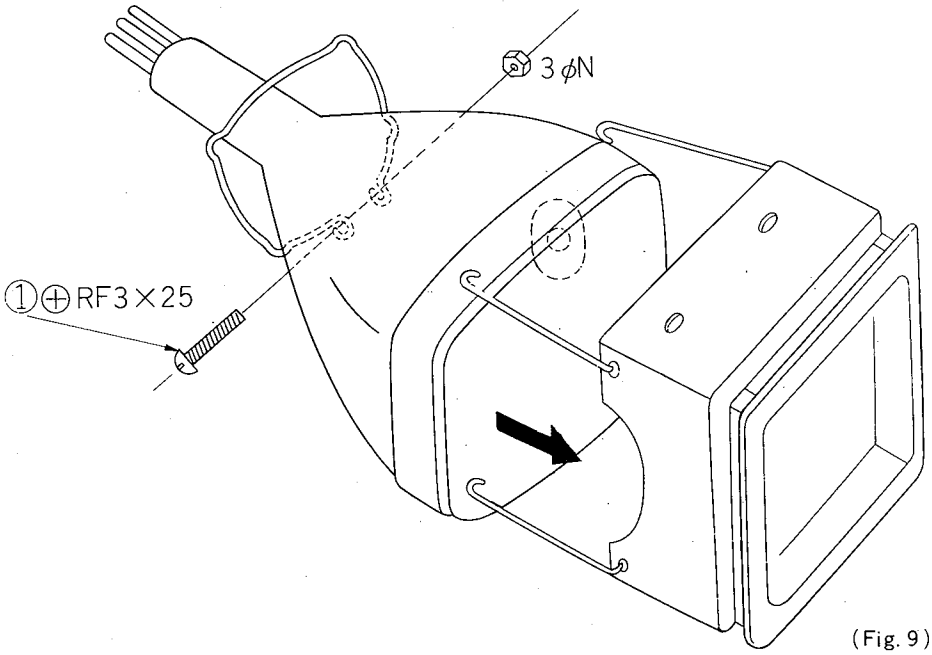
(Fig. 7)

To Remove the Picture Tube

(1) Remove the Left Side Panel, Right Side Panel and Bottom Cover.
(2) Remove the Upper Panel and Hood.
(3) Remove the four Screws (① ②in Fig. 8).
(4) Remove the Picture Tube Clamp Screw (①in Fig. 9).



(Fig. 8)



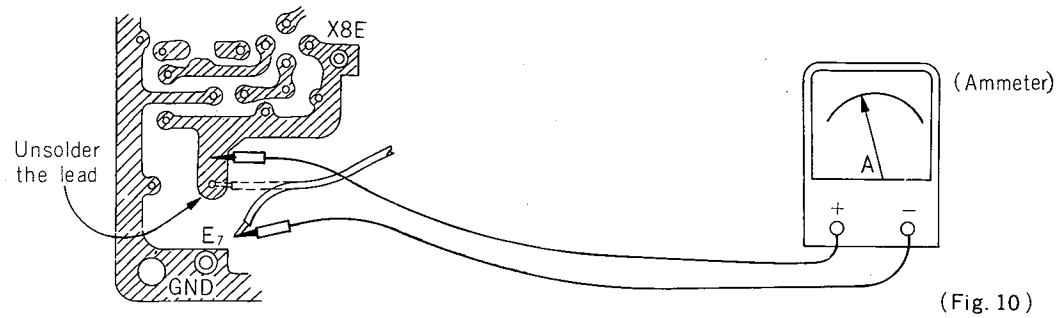
(Fig. 9)

Electrical Adjustment

Circuit Board Adjustments

A. Current Drain Check

(1) Apply AC 12V to Circuit Board and check the reading of current drain with Ammeter (Fig. 10).
Rated value: 450 mA ±50 mA



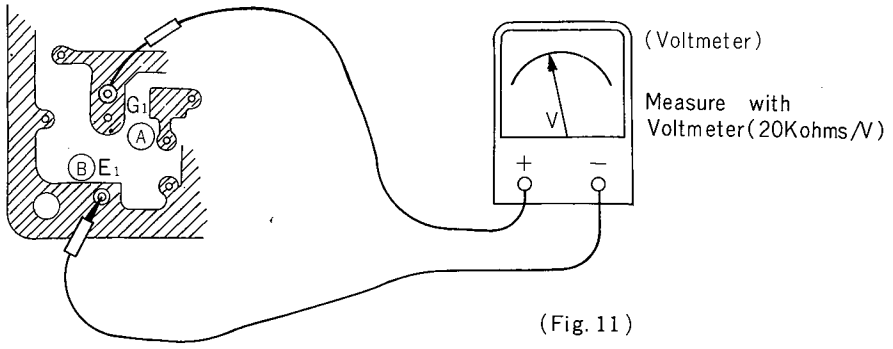
(Fig. 10)

B. Overall Adjustment

(1) Confirm that Picture Tube Socket is disconnected from Picture Tube.

(2) Apply AC 12V for power supply to Circuit Board through 9P Connector.

(3) Connect VOM to the designated parts. Ⓐ and Ⓑ on Circuit Board to read DC Stabilizing Output Voltage as shown in Fig. 11 and adjust Adjustable Resistor (R_{12}, 1 K ohm) so that the voltage of 10V is obtained.
VOM range: 10~15V range

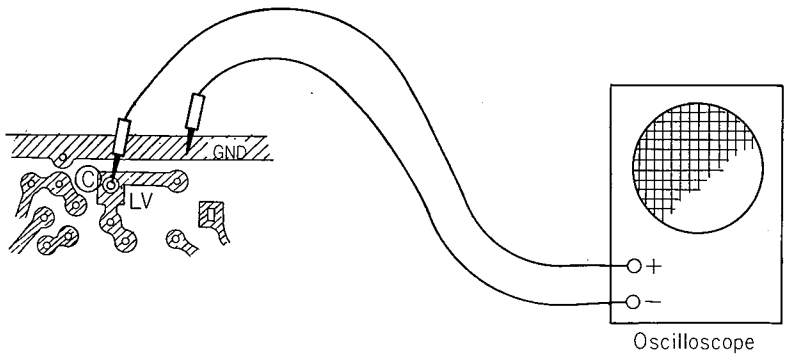


(Fig. 11)

(4) Vertical Deflection Adjustment

a. Apply vertical deflection signal through 9P connector.

b. Saw-tooth waveform should be obtained between ground and part Ⓒ in Fig. 12 with oscilloscope, (voltage waveform)



(Fig. 12)

Complete Spare Parts List for View-finder (CVF-4)

General

Part No.	Description	Q'ty
	Printed Circuit Borad, completed	1
1-451-008	Deflection Yoke Ass'y	1
1-453-007	High Voltage Block Ass'y	1

A. Mechanical Parts

3-790-617	Instruction Manual	1
X-44900-02	Silicon Cloth in Polyethylene Bag	1
7-491-001	Desiccant	1
2-042-102	Chassis (a)	1
-103	" (b)	1
-104	Picture Tube Mt'g Frame	1
-105	Holding Plate for Volume Control	1
-106	Mounting Bracket for 9 Pole Connector	1
-107	Reinforcement	1
-108	Ornamental Plate for Volume Control Knob	1
-109	Top Panel	1
-126	Bottom Cover	1
-111	Side Panel (Right)	1
-112	" " (Left)	1
-113	Mask	1
-114	Mounting Screw	1
-115	Spring	1
-116	Picture Tube Mt'g Hook	4
-118	Hood	1
-128	Name Plate	1
-120	Transistor Mt'g Plate	1
-121	Circuit Board Holding Plate	1
-132	Cushion for Hood	(1)
-133	" "	(2)
4-003-819	Picture Tube Protector	1
-820	Picture Tube Mt'g Wire Ring	1
2-042-029	Volume Control Knob	2
-044	Wire Net	1
2-030-503	Holding Plate for Choke Coil	1
2-042-131	Insulating Plate	2
4-008-364	Caution Label	1

Part No.	Description	Q'ty
7-621-255-22	Screw (+) RF 2 x 4; 9 Pole Connector	2
-259-22	" (+) RF 2.6x4; Mask	2
-259-22	" (+) RF 2.6x4; 9 Pole Connector Mounting Plate	2
-259-49	" (+) RF 2.6x6; Mask	2
-261-42	" (+) RF 3 x 6; Side Cover	4
-261-42	" (+) RF 3 x 6; Reinforcement	2
-261-42	" (+) RF 3 x 6; Chassis (b)	2
-261-42	" (+) RF 3 x 6; Printed Circuit Board	4
-261-42	" (+) RF 3 x 6; High Voltage Block	2
-261-42	" (+) RF 3 x 6; Printed Circuit Board	2
-261-42	" (+) RF 3 x 6; Transistor Mounting Plate	4
-261-42	" (+) RF 3 x 6; Ornamental Plate for Volume Control Knob	2
-261-42	" (+) RF 3 x 6; Holding Plate for Volume Control	2
-261-62	" (+) RF 3x10; Transistor X7,8	4
-262-52	" (+) RF 3x25; Picture Tube	1
-559-52	" (+) K 2.6x8; Side Panel (right)	2
-559-52	" (+) K 2.6x8; Side Panel (left)	2
-261-20	" (+) RF 3 x 4; Picture Tube Mt'g Frame	4
-261-52	" (+) RF 3 x 8; Transistor X4	2
7-622-108-01	Nut 3ϕ; 9 Pole Connector	2
-108-01	" 3ϕ; Picture Tube Mt'g Frame	1
-108-01	" 3ϕ; Transistor X4	2
-108-01	" 3ϕ; " X7,8	2
-307-01	" 2.6ϕ; Mt'g Bracket for 9 Pole Connector	2
7-623-108-21	Washer 3ϕ; Transistor X7,8	4
-207-21	Spring Washer 2.6ϕ; Mask	4
-208-21	" " 3ϕ; Transistor Mt'g Plate	4
-208-21	" " 3ϕ; Chassis	2
-208-21	" " 3ϕ; Volume Control Knob for Ornamental Plate	2
-208-21	" " 3ϕ; Holding Plate for Volume Control	2
-208-21	" " 3ϕ; Circuit Board Holding Plate	1
-208-21	" " 3ϕ; Reinforcement	2
-208-21	" " 3ϕ; Mt'g Bracket for 9 Pole Connector	2
-408-01	External Tooth Washer 3ϕ; Printed Circuit Board	4
-508-01	Lug Washer 3ϕ; Transistor X7,8	1
3-109-907	Ground Terminal for Test Point	9
2-042-123	Packing Carton	1

Part No.	Description	Q'ty
2-042-124	Styro-foam Cushion	2
-125	Polyethylene Bag	1

B. Electrical Parts

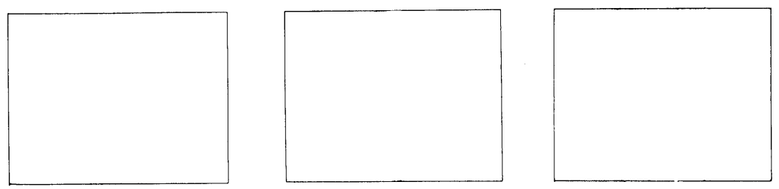
	Transistor	2SD28	X7,8	2
		2SC41	X4	1
		2SB382	X3	1
		2SC756	X9	1
		2SC318	X1,10	2
		2SC470	X2	1
		2SC318	X5,6	2
	Diode	1T22A	D1	1
		RD5A	D10	1
	Power Rectifier	10DB2	D6 --- D9	1
		HFSD-1Z	D2	1
		FR-1U	D5	1
		HFSD-1A	D4	1
		SD-1A	D3	1
1-407-028	Micro Inductor	56uH, L2		1
-044	" "	82uH, L1		1
1-421-013	Horizontal Choke Coil	25uH L3		1
1-425-098	"	Pulse Transformer, H.P.T.		1
1-437-003	"	Driver Transformer, H.D.T.		1
1-421-184	Vertical Output Choke Coil, V.C.H.			1
1-538-678	Printed Circuit Board			1
1-221-314	Variable Resistor;	B-1M ohms	R-21	1
-538	" " ;	B-300 "	R-1	1
-494	" " ;	B-500 "	R-25	1
-415	" " ;	B-500 "	R-2	1
-495	" " ;	B-1K "	R-42	1
-498	" " ;	B-10K "	R-27,34	2
1-507-080	Faston Receptacle			17
1-508-158	9 Pole Miniature Connector Plug			1
1-526-055	Picture Tube Socket			1
873110420	Picture Tube, CT-465			1
1-506-163	Faston Tab			30
1-902-678	Jumper Read			1
-679	" "			1
1-902-841	Frame Harness			1

Part No.	Description				Q'ty
	Carbon Resistor				
1-242-643	RD¼UR	75 ohms	R26		1
-617	"	4.7 "	R35		1
-629	"	15 "	R30,15		2
-633	"	22 "	R29		1
-647	"	82 "	R7		1
-649	"	100 "	R6,44		2
-657	"	220 "	R19		1
-661	"	330 "	R16,31,39		3
-665	"	470 "	R8,40		2
-667	"	560 "	R38		1
-669	"	680 "	R41,43		2
-681	"	2.2K "	R5		1
-683	"	2.7K "	R4		1
-685	"	3.3K "	R3		1
-689	"	4.7K "	R18,32		2
-695	"	8.2K "	R28,45		2
-701	"	15K "	R2,20,14		3
-703	"	18K "	R1		1
-705	"	22K "	R17		1
-711	"	39K "	R24		1
-673	"	1K "	R10,(R46)		1
-671	"	820 "	R33		1
-679	"	1.8K "	R9		1
1-207-063	Wire Wound Resistor	RW½RL	0.43 ohms	R12 ---	1
1-202-293	Composition Resistor	RC½BF	1M ohm	R22 ---	1
-277	" "	"	2M ohms	R23 ---	1
-279	" "	"	3.3M "	R11 ---	1
-447	" "	RC½	470K "	R13 ---	1
	Capacitor				
1-105-681	Mylar	0.047uF	50WV	C6	1
-885	"	0.1uF	100WV	C4	1
-761	"	0.047uF	200WV	C18	1
-711	"	0.0068uF	100WV	C8,10	2/5
-713	"	0.01uF	"	C8,10	2/5
-715	"	0.015uF	"	C8,10	2/5
-716	"	0.018uF	"	C8,10	2/5
-717	"	0.022uF	"	C8,10	2/5

Part No.	Description				Q'ty
1-121-454	Electrolytic Capacitor	3uF	12WV	C12 ------	1
-280	" "	5uF	"	C7 -------	1
-285	" "	30uF	"	C1,2,21 --	3
-288	" "	50uF	"	C13,15,16-	3
-292	" "	100uF	"	C3 -------	1
-296	" "	200uF	"	C9,17 ----	2
-186	" "	1000uF	"	C22 ------	1
-426	" "	500uF	15WV	C20 ------	1
-025	" "	1900uF	"	C19 ------	1
-246	" "	5uF	150WV	C5 -------	1
1-107-005	Mica Capacitor	220PF	1500WV	C28 -------	1
1-113-122	PS Capacitor	0.05uF	500WV	C11 -------	1
1-127-910	Alox Capacitor	10uF	6WV	C14 -------	1

c. Adjust R_{25} (500 ohms) for Gain so that the voltage of approx. 8.5Vpp is obtained with step b set-up.

d. Display Test Pattern on the Picture tube of set Adjust the Vertical Height Control R-34 (10K ohms) and Vertical Linearity control R-27 (10K ohms) to obtain the standard picture shown in Fig.13.



R27 (10kΩ) V linearity　　Normal Picture　　R34 (10kΩ) V Height

(Fig. 13)

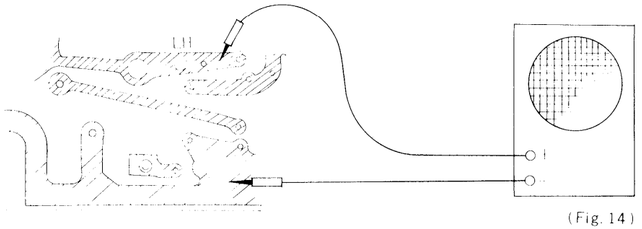
(5) Horizontal Deflection Adjustment

a. Connect oscilloscope between part and Ground shown in Fig.14.

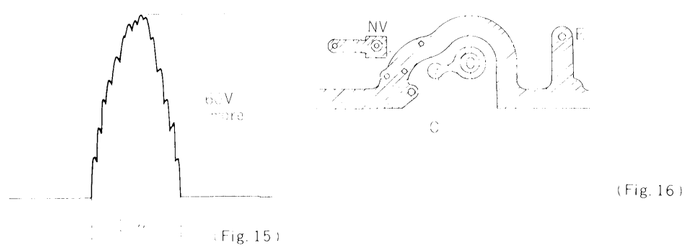
b. Feed a horizontal deflection signal. While checking waveform by oscilloscope, so that the waveform shown in Fig.15 is obtained, confirm that pulse width is 10㎲ and voltage is 60Vpp or more.

In case the pulse width is too wide or two narrow, mount a capacitor that is selected by following step.

c. For mounting the Mylar Capacitor C_{19}, select a proper value of the capacitance in the range of 0.0068㎌~0.015㎌, 100WV so that the waveform of 10㎲ pulse width is obtained on the picture screen, and solder it on the Printed Circuit Board.

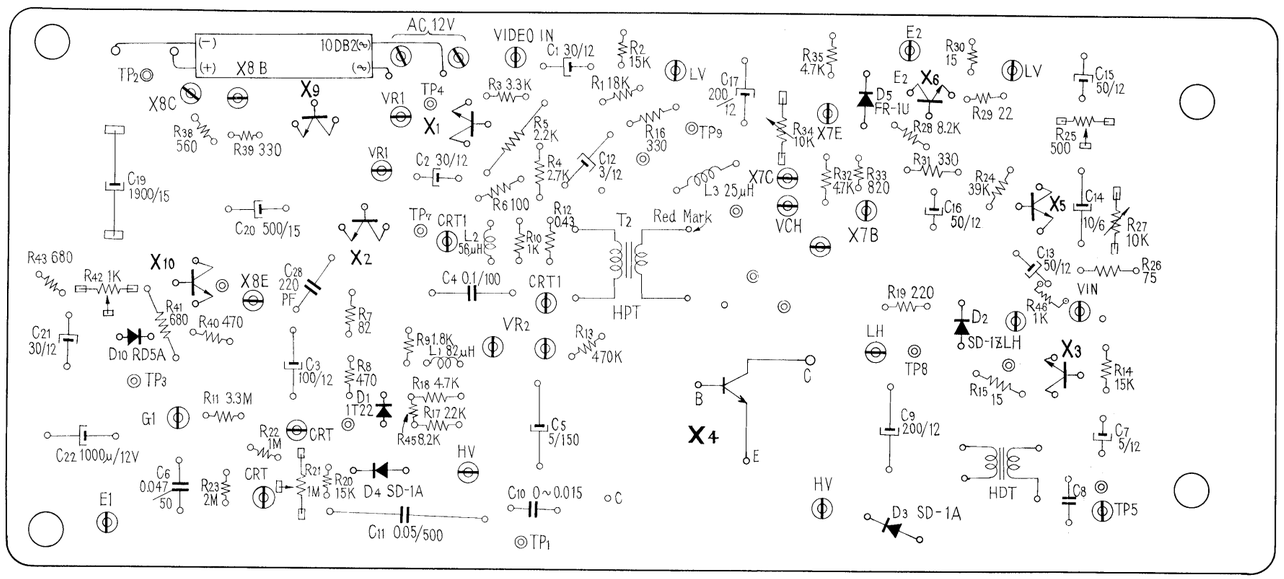


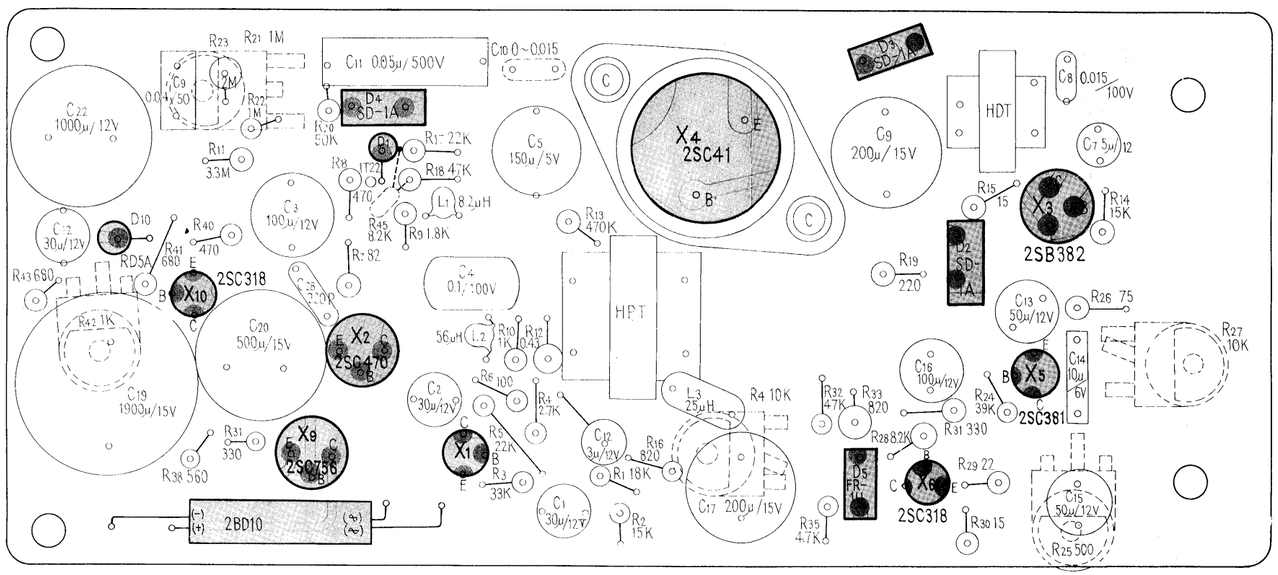
(Fig. 14)



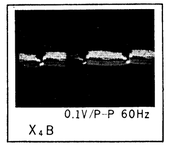
(Fig. 15)

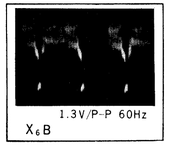
(Fig. 16)

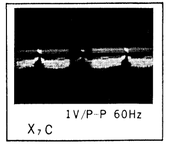


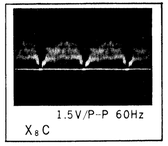


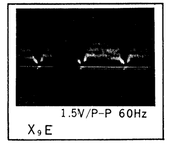
6-2. WAVE FORMS

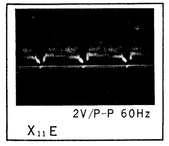


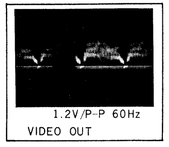


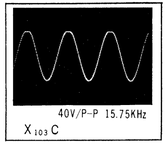


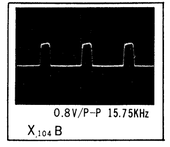


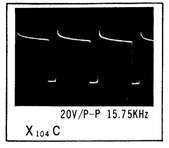


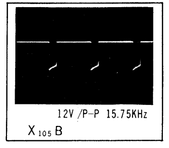


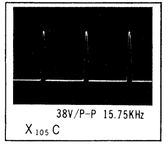


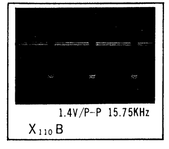


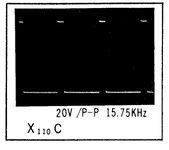


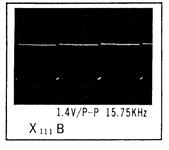


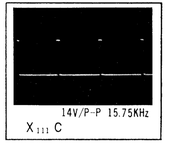


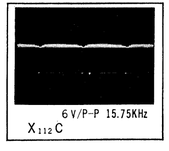


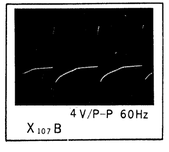


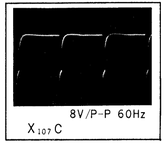


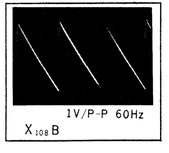


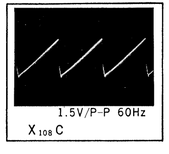


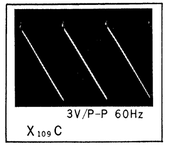




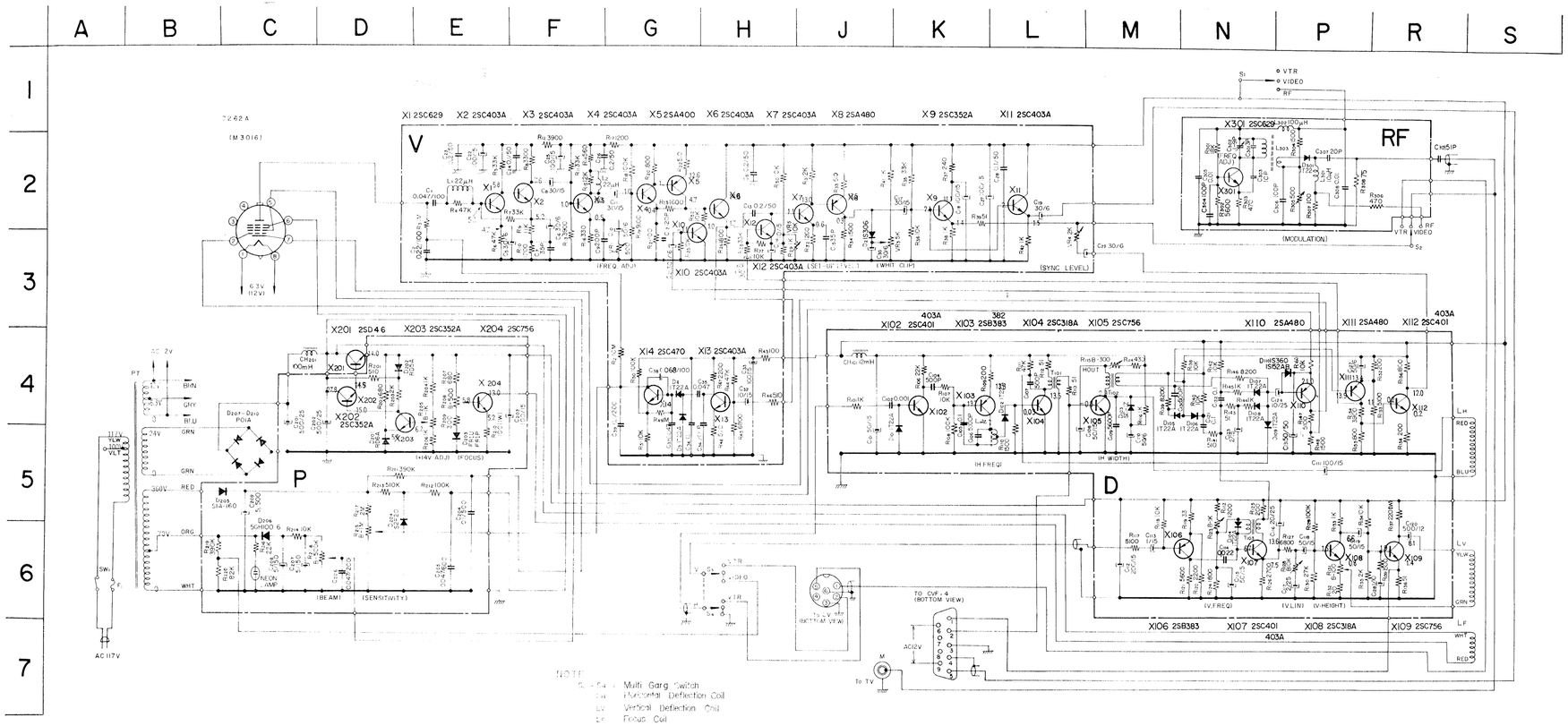








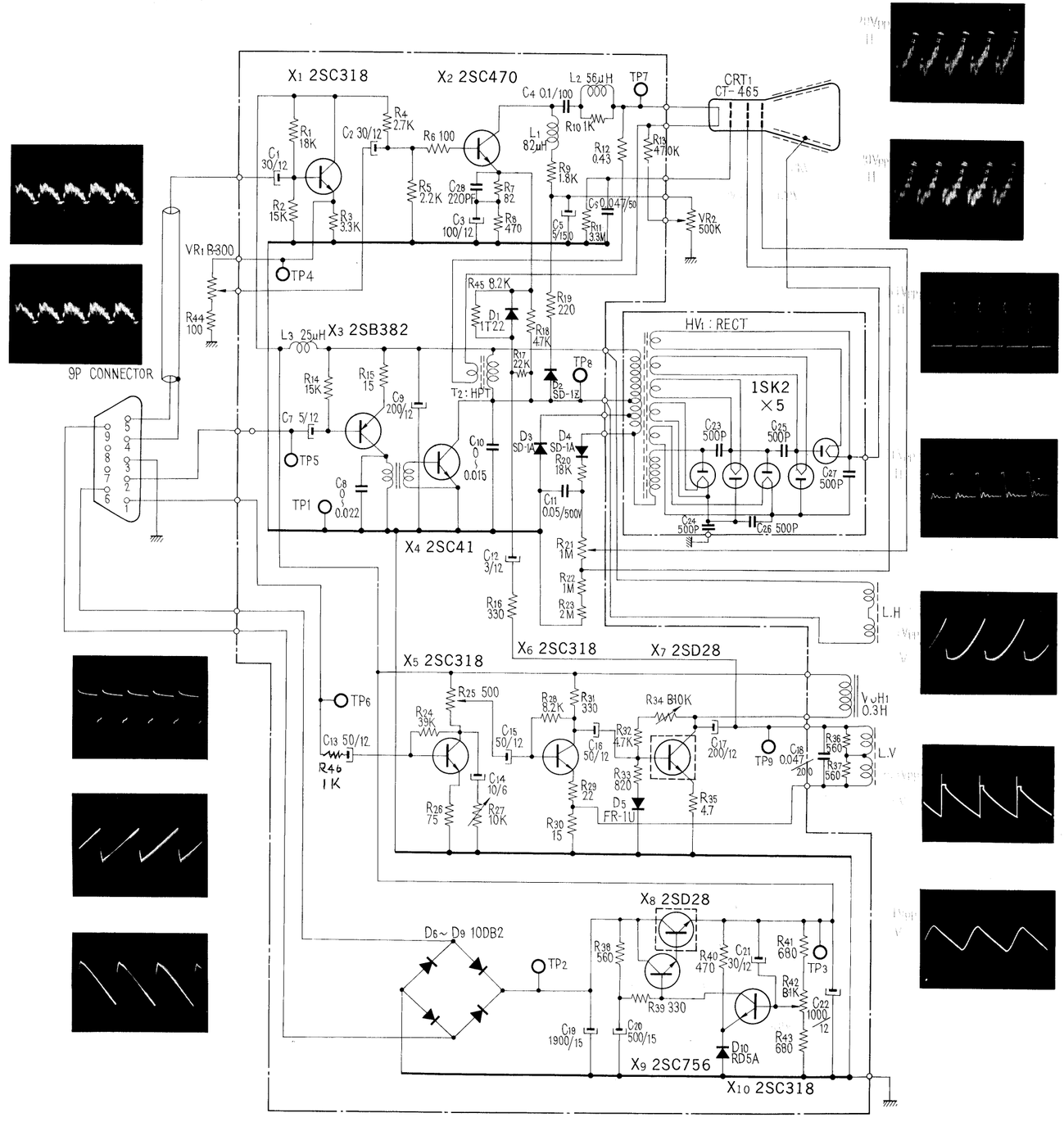
6-3. SCHEMATIC DIAGRAM

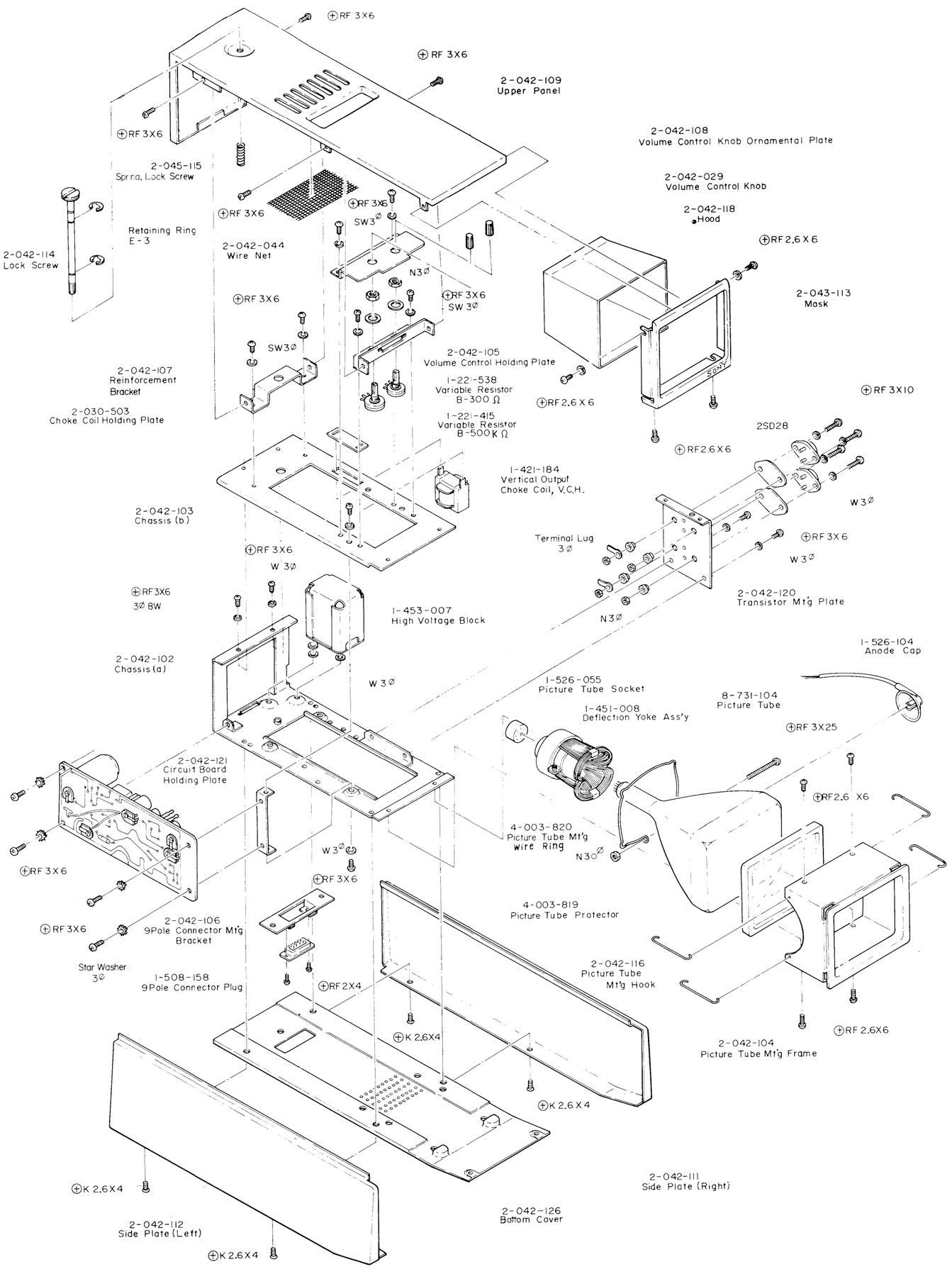


CVC — 2100 A
SCHEMATIC DIAGRAM

© 1968

Notes.


X1 2SC318
X2 2SC470
L2 56μH
TP7
CRT1 CT-465
C4 0.1/100
R10 1K
R1 18K
C2 30/12
R4 2.7K
R6 100
L1 82μH
C1 30/12
R2 15K
R3 3.3K
R5 2.2K
C28 220PF
R7 82
C3 100/12
R8 470
R9 1.8K
R12 0.43
R13 470K
C5 5/150
C6 0.047/50
R11 3.3M
VR2 500K
VR1 B-300
TP4
R44 100
9P CONNECTOR
R45 8.2K
D1 1T22
R19 220
R18 4.7K
L3 25μH
X3 2SB382
HV1 : RECT
R14 15K
R15 15
C9 200/12
R17 22K
TP8
D2 SD-1Z
T2 : HPT
1SK2 ×5
C7 5/12
TP5
C10 0 ~ 0.015
D3 SD-1A
D4 SD-1A
R20 18K
C23 500P
C25 500P
C27 500P
C8 0 ~ 0.022
TP1
C11 0.05/500V
C24 500P
C26 500P
X4 2SC41
C12 3/12
R21 1M
R22 1M
R23 2M
R16 330
L.H
X6 2SC318
X7 2SD28
X5 2SC318
TP6
R25 500
R24 39K
R28 8.2K
R31 330
R34 B10K
C15 50/12
C16 50/12
R32 4.7K
C17 200/12
TP9
C18 0.047/200
R36 560
R37 560
L.V
V.H1 0.3H
C13 50/12
R46 1K
C14 10/6
R26 75
R27 10K
R33 820
D5 FR-1U
R35 4.7
R29 22
R30 15
X8 2SD28
D6 ~ D9 10DB2
TP2
R38 560
R40 470
C21 30/12
R41 680
TP3
R42 B1K
C22 1000/12
R39 330
C19 1900/15
C20 500/15
D10 RD5A
R43 680
X9 2SC756
X10 2SC318


⊕RF 3X6
⊕RF 3X6
2-042-109
Upper Panel
⊕RF 3X6
2-042-108
Volume Control Knob Ornamental Plate
2-045-115
Spring Lock Screw
2-042-029
Volume Control Knob
⊕RF 3X6
⊕RF 3X6
SW3Ø
2-042-118
Hood
⊕RF 2.6X6
Retaining Ring
E-3
2-042-044
Wire Net
2-042-114
Lock Screw
N3Ø
⊕RF 3X6
⊕RF 3X6
SW 3Ø
2-043-113
Mask
SW3Ø
2-042-105
Volume Control Holding Plate
2-042-107
Reinforcement
Bracket
1-221-538
Variable Resistor
B-300 Ω
⊕RF 2.6X6
⊕RF 3X10
2-030-503
Choke Coil Holding Plate
1-221-415
Variable Resistor
B-500K Ω
2SD28
⊕RF2.6X6
1-421-184
Vertical Output
Choke Coil, V.C.H.
2-042-103
Chassis (b)
W3Ø
Terminal Lug
3Ø
⊕RF 3X6
⊕RF 3X6
W 3Ø
W3Ø
⊕RF3X6
3Ø 8W
2-042-120
Transistor Mt'g Plate
1-453-007
High Voltage Block
N3Ø
1-526-104
Anode Cap
2-042-102
Chassis (a)
W 3Ø
1-526-055
Picture Tube Socket
8-731-104
Picture Tube
1-451-008
Deflection Yoke Ass'y
⊕RF 3X25
2-042-121
Circuit Board
Holding Plate
⊕RF2.6 X6
4-003-820
Picture Tube Mt'g
Wire Ring
N3Ø
⊕RF 3X6
W3Ø
⊕RF 3X6
4-003-819
Picture Tube Protector
⊕RF 3X6
2-042-106
9Pole Connector Mt'g
Bracket
Star Washer
3Ø
1-508-158
9Pole Connector Plug
⊕RF2X4
2-042-116
Picture Tube
Mt'g Hook
⊕K 2.6X4
⊕RF 2.6X6
2-042-104
Picture Tube Mt'g Frame
⊕K 2.6X4
2-042-111
Side Plate (Right)
⊕K 2.6X4
2-042-126
Bottom Cover
2-042-112
Side Plate (Left)
⊕K 2.6X4